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EDITORIAL NOTES.

Approaching the End.

LAST week was one of many conferences in connection with the coal stoppage; and there now appears to be fair prospect that the final scenes in this great catastrophe (due to the follies of Cook and Smith and their puppets) are now being enacted. The Government, the coal owners, and the Miners' Federation are together again; and this is due in some measure to the activities of the General Council of the "T.U.C.," and to the decisions of certain of their components not to impose any embargo on the handling of coal and to do nothing more than to suggest a voluntary levy of a penny per week on the members of trade unions generally, which voluntary levy, if every member subscribes, would only produce what one jocular miners' leader says "would be sufficient to provide half-a-pint or half-an-ounce for each miner still withholding his services from the industry." Another matter which has at last persuaded the Federation to have regard to cold reason and economic facts, is that something like 305,000 miners are now at work, satisfied with their conditions, and with the wages which they are able to earn; they also appreciate that their destructive adventure has failed, and that their idea that they could be sole dictators had no solid foundation. A point has been reached at which the owners, having resolved not to accept any national agreement, have declared themselves willing to agree to a set of national principles to be applied to each district agreement; and it appears likely that the Miners' Federation will, as they find a national agreement impossible, be willing to accept these principles, subject to discussion of their details. It is understood that a fair summary of the principles to which the Government believe they can obtain adherence is as follows: (1) In any district the minimum shall not be lower than that contained in the 1921 agreement—*i.e.*, 20 p.ct. above standard rates. (2) The ratio in which the surplus profits of the industry are to be divided shall not be lower than 85 to wages and 15 to profits, or higher than 87 to wages and 13 to profits. (3) The present method of ascertainment of the proceeds of the industry to be retained. (4) Subsistence wage not to be lower than it was in April last in any district. There is no mention here of hours, which will have to be the subject of decision in the district negotiations, although the Miners' Federation are pressing for a maximum of seven-and-a-half hours, which is said to be impossible in the export areas. With regard to the subsistence rate, it is believed that the owners do not at present agree with the view put forward by the miners, that it should be at the pre-stoppage rate. There is no need to review the proceedings of the past ten days which have led up to this briefly outlined position. What we shall all be thankful to see is the end of this lamentable business—but only on terms which will safeguard the interests of the country. At the moment, the Miners' Federation are acting obstructively, with the view of saving as much as possible from the wreckage.

Intermittent Vertical Chambers for Gas Making.

RAMSGATE has become a pioneer (so far as this country is concerned) in connection with a new type of carbonizing plant for gas making; and the Corporation Gas Committee and their Engineer and Manager, Mr. R. H. Ruthven, have every confidence that, in their circumstances, their choice and enterprise will be fully justified. We congratulate them upon what they have done; but we can assure them that the eyes of the whole gas profession will be turned upon their new venture in carbonization practice, watching for the working attestation of the validity of their beliefs. They have not, nor have we, the slightest fear on this score. The type of plant adopted is the Woodall-Duckham vertical chamber setting; and its selection was made not only from the point of view of efficiency, but on the ground of suitability for local requirements. The Committee and their Engineer sought a plant which, having regard to the restricted area of the works, would not occupy much space in relation to production; they wanted one which would be economical to operate; one which would deal with coals fine or excessively swelling, including the varieties obtainable from the Kent collieries; one which would give them a coke comparable in physical characteristics with the production from the old horizontal settings, for which coke they have developed a good local market, which they do not wish to disturb. The intermittent vertical chambers give a similar kind of compact coke, which has the additional advantage of being drier than horizontal coke, due to the controlled quenching in the tower provided for the purpose.

However, the range of requirement was found to be satisfied by the Woodall-Duckham chambers. A description of the installation is given in later columns. It will be seen that it consists of a bench of four settings; comprising in all fifteen chambers. Two of the settings contain five chambers each; one, three chambers; and the other, two chambers. Each chamber holds 2·25 tons of coal; and, with a coking period of twelve hours, this gives a throughput of 4·5 tons per chamber per day, or 67·5 tons for the whole plant. This allocation of chambers per setting enables the Engineer to obtain, with such bulky charges as 2·25 tons, a good flexibility in the matter of production in relation to seasonal demand. It may be pointed out, however, that such an arrangement is really not necessary, as elasticity can easily be produced and controlled by suitably altering the length of the carbonizing period.

Regarding the point of the small ground space occupied by the Woodall-Duckham vertical chambers, comparison of the old-fashioned with the new-fashioned plant is interesting. The old retort house contained stop-ended horizontal retorts. Its area was 41 ft. 3 in. by 103 ft., which equals 4249 sq.ft. From this area there was a gas output of 500,000 c.ft. per day, and the average per square foot of ground space per day was 117 c.ft. The area occupied in the house by the new intermittent vertical chambers is 41 ft. 3 in. by 68 ft., which is equal to 2805 sq.ft. On this much smaller area, the gas output is 945,000 c.ft. per day, which averages 337 c.ft. per

square foot of ground space per day. The ultimate daily output, when the whole of the old house is equipped with the new intermittent chambers, will be equal to 1,575,000 c.ft. per day, or an average of 370 c.ft. per square foot of ground space per day. It is thus seen that with the new plant the output per square foot of space is three times as great as from the plant that has been displaced; in other words, the clearing-away from the house of the old horizontals (with a gas output of 500,000 c.ft. per day) will ultimately give place to intermittent vertical chambers with an output of upwards of 1,500,000 c.ft. per day. The man who makes two blades of grass grow where one grew before is said to be a benefactor to mankind. Here we have 3 c.ft. of gas being produced per day where 1 c.ft. was produced before. This is another illustration of the remarkable advance that has been made in carbonization processes and practices. It is manifest that Ramsgate has made a change which will be highly beneficial to the future of the gas undertaking.

As previously remarked, this is the first intermittent vertical chamber plant built in England; and therefore it is a new feature in carbonizing practice in this country. There is in each chamber what would be equivalent to the space occupied by three intermittent retorts. In other words, three retorts are made into one large carbonizing chamber, which thus increases the output per unit of ground space. It is also noteworthy that, by care in design, it has been possible to include the same type of silica construction which has proved so successful in continuous carbonizing retorts. The silica chambers allow higher temperatures to be maintained, with the result that quick carbonizing times are realizable. Further, by the introduction of twelve-hour charges, it is possible to operate the plant on two eight-hour shifts per twenty-four hours. One other consideration is that the vertical chamber (apart from the larger output per unit of ground space occupied) has the added commendation that the charge may be satisfactorily steamed during the last two hours of operation—thus increasing the thermal yield per ton of coal carbonized.

There is good confidence that many engineers will be anxious to examine the new plant, for heavier charge operation has its attractions among them. The results and other experiences of working, after the lapse of a reasonable period, are eagerly anticipated.

Coke-Oven Gas and the Coal Stoppage.

Many enthusiasts for the concentration of gas, electricity, and chemicals production at the collieries of the country do not appear to take account of the exposure to a vast stoppage which this might entail, and the terrible consequences. We have an illustration in the coke-oven plants. Naturally it is economical, so far as coal handling and transport are concerned, for such plants to be located contiguous to the source of coal supply; but this wedding of coking plants to the collieries has the disadvantage that, in the case of a dispute such as that of 1921 or the present stoppage (which has more than doubled the duration of the former), the activities of the plants are, through the operations of the miners' unions, discontinued coincidently with those of the mines themselves. This has a grave result; but, according to the scheme of reconstruction which the Miners' Federation placed before the Royal Commission on the Mining Industry, it is part of their policy that not only coke-ovens, but plants for the production of gas, electricity, and chemicals should be brought within the ambit of the mining industry, and be under one authority. There is little doubt that one object of the extremists of the Federation in making this proposal is to increase their stranglehold upon the country. Assuming such a scheme were consummated, the next effort of the Miners' Federation (providing it survives the present catastrophe into which it has led its followers) would be to bring all the labour employed in these various associated industries under their domination. Even were the scheme feasible, such a power can never be allowed in this country; and there must be strict guarding against any development in that direction.

As we have said, the coking industry affords a warning of this. In the process of conserving coal and utilizing its products to the best advantage, relationships have been effected between coke-oven owners and town-gas suppliers. According to the Board of Trade Returns for 1925, the latter purchased from the former no less than 4,797,752,000 c.ft., distributed among twenty-one undertakings; and before the stoppage, there were prospects of the business being extended between the two industries. The largest purchaser of coke-oven gas in 1925 was the Sheffield Gas Company, with 1,849,299,000 c.ft.; Middlesbrough came next, with 916,640,000 c.ft.; Leeds ranked third, with 401,668,000 c.ft.; Rhymney and Aber came fourth, with 293,661,000 c.ft.; and Rotherham fifth, with 240,710,000 c.ft. Other undertakings were smaller buyers. The supplies of coke-oven gas to cities and towns ceased early in the stoppage; and the experience is such that, it can be said, if this business is to develop to any extent, something effective must be done to separate metallurgical coke production from the mines, so that the supply of gas will not suffer discontinuance, notwithstanding a dispute between the colliery owners and the miners.

The Sheffield Gas Company, as pointed out above, were the largest buyers of coke-oven gas last year. In the address which Mr. Ralph Halkett, the General Manager and Secretary of that Company, gave to the Yorkshire Junior Gas Association, as reported last week (p. 304), he spoke briefly but feelingly on this subject. He drew attention to the great disadvantage to which we have been referring; and he did so warningly for the benefit of those who have no experience of coke-oven gas, but who may desire some day to try it. As he remarked, any dispute in the coal industry affects the coke-ovens; and therefore provision must be made at gas-works which purchase coke-oven gas to meet any failure of the coking industry to maintain supplies. Thus, when estimating the possible economy of taking coke-oven gas for town supply, consideration must be given to the cost of plant lying idle (which must be maintained) to augment the works' production when the coke-oven gas fails. Of course, maintenance of stand-by plant in good condition is only one phase of this important matter, though a fairly expensive one. Another is that, on a stoppage of the coking plants, it is necessary to find the men to operate the works' plant which has been standing idle—possibly for years—although we recall that, at the commencement of the present stoppage, we had an excellent account of what Middlesbrough had done (relying, as it had been, solely upon a supply from coke-ovens) in successfully meeting the situation. As stated in our issue for June 2 (p. 446), Mr. Charles F. Blincoe, the Engineer and Manager, was thoroughly prepared to meet the emergency; and we heartily congratulated him upon his success. He was able to bring into use, immediately the supply of coke-oven gas began to diminish, the carburetted water-gas plant on his works. Towards the end of April, he had also commenced to heat up eight beds of inclined retorts, and both plants were restored to service without any untoward incident, notwithstanding that a large proportion of the retort-house men were entirely without previous gas-making experience. What he was then doing, and probably this has been continued since, was to make two-thirds of his required supply by the water-gas plant, and one-third by the coal-gas plant; thus producing from the latter sufficient coke to meet the requirements of the former. But it might be that all gas undertakings would not be in the favourable position in which Mr. Blincoe was in respect both of plant and of men who could so quickly acquire the necessary qualification for carrying on the operations of gas manufacture.

However, returning to what Mr. Halkett had to say on the subject. He submitted that if coke-oven gas is to be a commercial proposition for town-gas supply, it is necessary that collieries should have power from the Government whereby they would be able to work the coke-ovens and maintain the supply of gas during industrial disputes. Mr. Halkett could have said a great deal more upon this matter, but he refrained. However, his suggestion is one which should receive the very serious attention of the owners of coke-oven plants, as it would be a great pity if, in defence of town-gas supply, it became necessary to restrict in any way the development of healthy business relations between the two sister industries.

Advertising.

ADVERTISING with the Newcastle and Gateshead Gas Company has become a fine art. It has been developed in style and purpose to an extent that has won from us many expressions of admiration; and we have sometimes wondered whether it is possible for them to do anything better. The next sample, however, has given us the answer, and has brought conviction that, where there is a constant study of style, material, and purpose, there is no limit to new ideas of the most attractive order. We are confident of this—that, if the artistic style of presentation has induced us in London to read the message, it has had widespread perusal in the Company's area of supply; and advertising is of little use unless it is in a form which will court and obtain attention. This being our estimate of the advertising work of the Newcastle Company, we were peculiarly interested in seeing what Mr. T. P. Ridley, the Secretary and Commercial Manager of the Company, had to say regarding "Local Publicity" in the paper which he submitted at the recent annual conference of the British Commercial Gas Association. The contribution was published in the "JOURNAL" last week; and it has doubtless been widely read. There are some people who manufacture and trade who are of opinion that their expenditure on advertising should, when the fit for economy and cutting-down expenditure overtakes them, be the first item to suffer on applying the pruning knife. That, however, is not the view of those who conduct the most prosperous businesses in the country; it is not the view of the Newcastle Gas Company, who, faced by model electrical enterprise and a depressed industrial state, continue to put on flesh, and extend their advertising expenditure year by year. Advertising, with them, is an indispensable spirit in business. It is, of course, only one item in their propaganda; but there is no doubt it is regarded as the most important.

Advertising can take several forms, and run in many channels. There is appeal by the newspaper, the circular, the booklet, and the showrooms. All have their part, place, and use. But newspaper advertising stands at the head. It is the means for making a start in the capturing of new business. It reaches unexpected quarters. It catches the eye of more people in a day than a big staff of officers can possibly do who come into contact with "prospects;" it starts that interest which makes the canvasser more welcome and the showroom a place at which to call to make inquiries. Mr. Ridley describes this form of publicity as the most "vital method" for securing new business; and he is right. His experience has brought the conviction. It is not because competitors do this that we also do it; it is because it is an integral and essential method of operation in business development.

In advertising, as Mr. Ridley points out, in the gas industry we do not spend enough. In fact, he categorically declares that we do not spend adequately to secure large businesses, and if the big prosperous businesses in other lines of commerce are a good criterion (he quotes the proportions of the incomes of some of them which are spent on advertising), then his case is proved up to the hilt. But in an industry such as ours, advertising must be both national and local. Regarding the former, the "B.C.G.A." operates in channels which the individual undertaking cannot occupy consistently and effectively. But though the Association are supported by undertakings representing 90 p.ct. or more of the gas supply of the country, the income for their work is less than 0·1 p.ct. of the receipts from the sale of gas, while 1 p.ct. would give them no less than £500,000 a year. Mr. Ridley does not suggest that they should have such a sum yearly; all he does is to show how big an amount is represented by a very small percentage of the receipts for gas. The Association, however, must have more if they are, in the interests of the industry, to operate with success against the new conditions which are assailing it with increased vigour. We wish to maintain, and if possible enlarge, the tide of success which is being experienced in the present day so far as gas sales are concerned, and not allow it to be reduced by our competitors. As to local publicity, the Newcastle Company spend more on it than many other undertakings. Year by year the sum has been increased, as the Directors are satisfied that the expenditure is justified by the results. Nevertheless, Mr. Ridley tells us that the Company have not yet reached their maximum outlay for this purpose. The amount authorized for local publicity this year represents over six times the amount of the subscription payable by the Company to the "B.C.G.A.;" and it does not include the costs of the sales staff or the expense of running the showrooms. This statement must not be regarded as a boast on the part of the Company. They take no credit for spending on publicity at a higher rate than the majority of undertakings; it is simply that they have learned to spend by the force of circumstances. In the paper, the author quotes some of the results recently experienced by them. When it is considered that these have been obtained under the depressed industrial and trade conditions which have reigned on the North-East Coast, and that the area represents the most up-to-date electrified portion of the United Kingdom, then there is good ground for congratulating the Company upon their success, and upon the wisdom of their advertising policy. There is much information in the paper which should be studied by every administrator and executive officer in the gas industry who desires to learn of the publicity operations of the progressive Newcastle Company.

Policy of Inspection and Maintenance.

THE gas industry is going through a constructional period just now in connection with the system of inspection and maintenance. It does not seem long ago that, whenever the question was broached, there was a great shaking of heads and talk of incurring grave responsibility. The latter is what may be termed the traditional idea; but it is dying out. The graver responsibility resides in protecting and promoting the interests of the gas undertaking, and that should be placed and be maintained in the front place of all consideration affecting the matter. It is a consideration which must ride supreme above the question of cost and methods of procedure; all must, of course, be taken into account, but the interests of the undertaking must have the "casting vote."

The paper by Mr. H. H. Creasey, at the Newcastle meeting of the "B.C.G.A." on the "Commercial Value of a Census of Consumers' Premises, and the Inspection and Maintenance of Appliances," brought out the fact, through the discussion, that there are fewer responsible men in the industry to-day who are opposed to the inspection and maintenance policy—or, at any rate, there are fewer who care to say they are—than was the case at one time. That is an industrial gain; and we are persuaded that the gain will grow through the force of circumstances, *plus* the relation and publication of such remarkable experiences as Mr. Creasey gave in his paper from the work which is carried on by the Gas Light and Coke Company. We are at present more concerned about the acceptance and practice of the policy than the methods adopted in carrying out the work, because these will settle down as time passes through the circulation of the details of the schemes adopted, and through individual experiences. At the same time, the practice will vary in detail according to the local circumstances of the gas suppliers. At the moment, however, we place a very big value upon the results of inspection and maintenance; and when such figures are presented as are recorded in the paper, they must have a valuable influence in promoting the view that in the system there is remarkable benefit, which is shared alike by undertaking and consumer. Naturally when such results are offered in proof of the efficacy of a system, there is interest in hearing the details of the work that is done to realize them. In the case of the Gas Light and Coke Company, the issues of the policy have been of such a distinguished order that the Company are gradually constructing a system which will eventually cover their whole vast area of operations—domestic, industrial, and commercial. To us, this alone is a striking testimony not only to the system, but to the courage of the Directors and their responsible officers in taking-up such work in such an extensive area, with its multitude of connections for gas utilization for almost countless purposes. What is more, they are doing it thoroughly—giving more and more employment to gas and men; and working up a business in sales of domestic and industrial appliances

which, in turn, enlarges the demand—and the diversity of demand—for gas. This in effect means that the sales department is having a new one built upon it. If the Gas Light and Coke Company can face this development in their mammoth circumstances, other undertakings can do the same.

We are not proposing to comment upon the detail of Mr. Creasey's paper and the discussion, inasmuch as the subject is of such importance that we are confident that, at this stage of its development, both will be widely studied to ascertain what is advanced in justification of the policy and the methods adopted in carrying it out, the latter of which, as we have already said, must vary structurally with local conditions. There is, however, the point as to cost, which in some cases is looked upon as an obstacle. The costs quoted are mostly gross, and take no account of the revenue that accrues from the work. The initial costs on the introduction of a scheme of inspection and maintenance will always average more per consumer, per 1000 c.ft. or per therm, at the outset than subsequently—for two reasons. First there is the training of men for the work, the work is new, it has to get established, and above all there is a rude awakening as to what requires to be done to supplant defect and inefficiency by soundness and efficiency. Secondly, what we must describe as the rough work at the inception of the scheme will always be more costly than the subsequent normal work. Then the next consideration is that every undertaking that has adopted the system of inspection, advice, adjustment, and maintenance, has reported a large increase through it of demand for additional appliances and for fitting work. That and the consequent and permanent additional consumption should be placed to the credit of the system. It cannot perhaps be done *in toto* in pounds, shillings, and pence; but the pounds, shillings, and pence are there. Thus it is that the figures that are quoted per consumer as the cost of maintenance at the introduction of a system require considerable discounting through the reduced cost which will obtain as the scheme develops, through the new consumption which directly results from it, through the saving of business which would be lost as a result of remediable dissatisfaction, and through the reduction of the expenditure demanded by attention to complaints. We have average costs of inspection and maintenance given ranging from 2s. 9d. up to 4s. (or so) per consumer per annum, which may in the early stages of a scheme work out to about 1d. to 1¾d. or even 2d. per 1000 c.ft. on the average consumption per consumer, or at the upper figure only 0·35d. per therm. But we have consistent testimony from the undertakings practising the system that those figures decrease as normal inspection and maintenance is approached, and they must also diminish as the average consumption per consumer goes up through the increase of connections per consumer which are directly attributable to the system.

We are prepared to agree with Mr. W. M. Carr that the cost, falling upon the price of gas, operates somewhat inequitably between large consumers and small. But it may be pointed out that the maintenance of efficiency is more important perhaps to the larger than to the small consumer through the economies resulting, and that in any system of vending (take, for example, the flat rate for gas) it is very difficult to reach that absolute perfection which will result in pure equity being meted out to all buyers. But with such a system of charging as a bi-part one, it would be very easy (as Mr. Carr recognizes) for the direct cost of maintenance to be scaled, and added to the primary or fixed charge, so leaving the secondary charge, with its potentiality in respect of enlarging demand, free from any charge for inspection and maintenance. This suggests another point, and it is that, under a two-part tariff, inspection and maintenance would have a developing influence upon the consumption at the lower secondary rate. If a balance-sheet could be made out, showing on the one side the cost of inspection and maintenance, and on the other the productive and protective value of the system, we feel certain a substantial profit would be the result. That is the conclusion to which Mr. Creasey's paper leads us.

During the discussion, the Mayor of Bexhill (Mr. Councillor B. Bending) reminded those present that—"He profits most who serves best."

The Call of Civic Government.

The whole community requires to be aroused regarding the importance of civic government. Part of it has been, and that part represents the Labour-Socialist section. In the recent municipal elections, they put 807 candidates in the field, and captured, in addition to the number held before, an additional 130 or so seats—distributed chiefly among the important industrial centres. The Labour-Socialists are very anxious to get control of our municipal affairs. Their method of operation is to get in the thin end of the wedge; their objective, when the power is theirs, is nationalization and communal control. In getting in the thin end of the wedge, they have been very successful—not through the merits of their policy, but through the indolence of other sections of those who have to pay rates and taxes. This is shown by an analysis of the potential voting power and its actual exercise in the municipal elections. The data for a number of industrial centres show that the percentage of those who voted ranged from 42 to 65 of the electorate. If this is the sort of thing that is allowed to persist, then it is only natural that the management of our civic affairs should drift into the wrong hands. We have of late had excellent demonstration of the squandering of the ratepayers' money in the interests of one class in districts where Labour-Socialists have paramount power; and gas-works and the manufacturers and contractors associated with the gas industry have had (with other ratepayers) to foot the bill. Like other ratepayers, they grumble. The experience is one which will extend if there is not a set turn of the tide from indolence to activity on the part of those who are not Labour-Socialists.

There is another aspect of this question; and it was illustrated during the general strike and also during the coal stoppage. During the former, there were electricity stations from which supply was discontinued owing to Labour-Socialist dominated Councils deferring to the commands of the trade unions to withdraw the men, or to cut-off supplies to the works of specified manufacturers. During the coal strike, there have been three or four instances of councils supporting the miners to the extent of depriving their local constituents of gas by declining to purchase imported coal, and so debasing, for political motives, their position as the governors and protectors of local interests and services. Such behaviour ought to be made a penal offence.

Distinct from indolence in voting, another point has been strongly urged for consideration by Alderman Fred. J. West, in an address which he delivered to the Manchester and District Bankers' Institute, of which he has been elected President—an honour which he deeply appreciates, and which he attributes to his Lord Mayoralty last year, and to his position in the industrial life of the city. He makes a strong appeal to men and women engaged in industrial and professional life to offer their services to local government. Not only must indifference to voting be abolished, but it is essential that the right type of candidates for local administration should come forward. If these matters do not receive attention, then it is no use for ratepayers to grumble when the affairs of local government take a wrong turning, and the liabilities increase of those who have to pay. Alderman West makes a confession. He has already had twenty-two years of municipal service. That is a long period for such voluntary work; but, considering his activities in other directions, it does not appear to have done him any harm. On the contrary, it has helped to broaden outlook and experience. He has also found the duty, responsibility, and variety of the work interesting. But that same period has seen the responsibilities of municipal government grow; and the magnitude of both the producer and the responsibilities is more likely to increase than diminish. That is another reason why ratepayers should be up and doing to get the right men and women to take part in public service. Where this condition exists, a close knowledge, and examination of the details, of the work accomplished will show that full value is obtained for the money expended. One part of the address shows how great are the responsibilities of the Manchester councillors. The combined capital expenditure of the trading departments alone—water, gas, electricity, tramways, and markets—amounts

in round figures to £29,000,000; their total expenditure last financial year was in the neighbourhood of £24,500,000; and the income was approximately the same sum. The departments employ over 27,000 people. Through these enterprises, there are vast inter-relations with other industries. Over the welfare of the community in respect of health and education, the local governing body also presides. When one considers all these activities, it needs no super-intelligence to appreciate how important it is to every ratepayer to get properly equipped men and women as administrators of civic affairs. To obtain such representatives is the duty of the citizens, by selecting suitable candidates, and by not neglecting the ballot-boxes. Gas undertakings are deeply concerned in this matter as large ratepayers; and therefore will be interested in the appeal Alderman West made through his instructive Presidential Address to the Manchester and District Bankers' Institute.

The Autumn Session.

Parliament re-assembled yesterday for the Autumn Session, with a most hopeful prospect of an early termination of the coal stoppage. It is at the moment impossible to say whether the settlement come to will need further legislation to give it effect; but it is hoped that nothing of the kind will be required. Although a great deal has lately been said on the subject of the amendment of the law affecting trade unions, there is not the slightest prospect of this being taken in hand until next year; and then it is probable that it will have a prominent place in the Government programme. One measure which it is hoped to pass through during the next few weeks is the Electricity Supply Bill. A large number of amendments have been tabled for consideration on third reading; and there is little question that what those who wish for modification do not secure in the Commons, will be pursued to the House of Lords. It is also noticed that the Merchandise Marks (Imported Goods) Bill, which has been before a Standing Committee, is down for completing its progress before Parliament again indulges in a vacation.

Coal Prices and Big Gas Consumption.

Matters have become topsy-turvy in respect of the relation of gas consumption to price. In normal circumstances, with the market values of secondary products in good state, an increase in gas consumption would be an indication of a probable reduction of price. Now, with coal prices where they are, an increased gas business necessitates an advance in the price of gas. The Directors of the Gas Light and Coke Company have had to give notice that, from the next reading of the indices, the price of gas will have to be advanced by 1d. a therm, which will make the charge 11·6d. The price has risen from 8·6d. to 9·4d., and then to the present figure of 10·6; and, after the December reading, it will have to be 11·6d. The total increase at the moment is only 2d.; at the end of December, it will be 3d. Fortunately, the price of coke has helped the Company, as it has done other gas undertakings. Had it not been for this, the Company would have had to make a much larger increase to meet the costs of maintaining their service to the consumers. It will no doubt be a surprise to the latter to learn that to do this the Company have had to buy 1,250,000 tons of foreign coal at high and constantly rising prices. At present they are paying nearly £5 a ton. The cold weather has caused a tremendous, though natural, increase in the consumption of gas. It was stated a few days ago that the increase in the Gas Light area during the previous three weeks had been 600,000,000 c.ft., in comparison with the output in the corresponding three weeks of last year. This abnormal consumption is one of the reasons the Company have had to make a further advance in the price of gas; for the more coal that has to be bought at present costs, the higher must be the price of gas. It would be more consistent with the Company's wishes if the public would use less gas while coal is at such a high price. This additional work and business brings no additional reward to the Company; for until the price of gas descends, no extra dividend can be paid.

How Gas is Helping a Hospital.

The Whitstable Gas and Coke Company, Ltd., are running what we believe is a novel competition; and the idea may be useful in other districts. The competition is in aid of the Whitstable Cottage Hospital; and £35 is offered in prizes. The first prize is £20; the second, £10; and the third, £5. The subject of the competition is how much gas will be made at the Whitstable Gas-Works between 12 o'clock noon, Saturday, Dec. 11, and 12 o'clock noon, Saturday, Dec. 18. Each competitor has to fill up a form, and forward it to the gas offices (accompanied by stamps or a postal order of the value of 6d.) before 12 o'clock noon on Saturday, Dec. 11. The whole of the proceeds is to be handed over to the Cottage Hospital; and no deductions for expenses will be made by the Company. A number of data are given in the competition circular as to consumptions during recent weeks in comparison with the consumptions in the corresponding periods of last year. Two judges have been appointed—Col. David Carnegie, C.B.E., F.R.S. (Edin.), M.Inst.C.E., and Alderman Sydney Brown, J.P., C.C. We hope the competition will be highly successful from the point of view of the hospital, and that the commendable enterprise of the Company will receive its due reward.

Smoke Abatement.

In another part of the "JOURNAL" to-day, we reproduce the interesting correspondence which Dr. Saleeby has had with the Ministry of Health on the subject of domestic smoke. The arguments contained in this are of such a nature that we think it will be useful for the staffs of gas undertakings to become acquainted with them, for use in their own localities in any discussions which arise on the reduction of the smoke pollution of the atmosphere.

Electricity Supply and a Labour Agreement.

It is reported that the Industrial Councils (both national and district) of the electricity supply industry, which have been inoperative since the general strike in May, have resolved to resume their activities. The electricity industry has for some years past been in a constant state of uncertainty regarding the operations of the principal Union of which the workers are members. All conceivable opportunities have been used to issue threats as to what the Union would do to bring about stoppages of supply if their demands were not complied with; and, during the general strike, they took up a very autocratic attitude towards several electricity supply concerns, and, through their action, illegally brought about stoppages of the supply. Now, however, it appears that a settlement has been arrived at under which the industrial machinery is to continue to function. The trade unions represented on the National Joint Industrial Council have given undertakings, attested by their general secretaries, that in future there shall be no stoppage of work, either sectionally or nationally, until the cause of difference has been referred to the District or National Council. Any breach of this will entitle the side of the Council not in default to give notice that they be forthwith dissolved. All electricity supply undertakings which are represented through the employers' organization are to be entitled to require that each employee, now or hereafter engaged by them, shall sign an agreement that his contract of service is in accordance with the terms and conditions agreed from time to time by the National and District Councils.

A Peace Pact.

The Shipbuilding Employers' Federation and the Federation of Engineering and Shipbuilding Trades have arrived at a new conciliation agreement, which provides for the prompt settlement of disputes without stoppage of work. The complete procedure provides for questions arising in any yard being dealt with by district or nationally, as the case demands, with provision for mutual reference to arbitration.

Improved Employment.

The registers of the employment exchanges on Oct. 18 recorded a total of 1,520,500 unemployed persons, or fewer by 15,832 than in the previous week, but 282,342 more than a year ago. The recorded figure on Oct. 25 was 1,516,200. This was 4275 fewer than the week before, but 283,804 more than a year ago. The figures are exclusive of persons who ceased work in the mining industry owing to the dispute.

PERSONAL.

The Court of Directors of the Gas Light and Coke Company have accepted with great regret the resignation of Mr. J. LISTER GODLEE from the Board. Mr. Godlee has been a Director for more than seventeen years, and was Deputy-Governor for over four years. He was for many years prior to joining the Board of the Gas Light and Coke Company, in July, 1909, associated with the late West Ham Gas Company—first as a Director, from March 30, 1874, and then as Chairman, from June 8, 1892.

Mr. W. C. BEARD, who retired last August, was presented, at the Bankside Works of the South Metropolitan Gas Company, with an oak bookcase, as a mark of the esteem and appreciation of his colleagues. In making the presentation, Mr. Cox mentioned that Mr. Beard had been in the service of the Company for over forty years, and was retiring at the early age of sixty through ill-health. He had served the Company devotedly in many ways, and, in addition to capably performing his duties as Works Chemist, had rendered useful service on the Board of Directors and the Co-Partnership Committee.

Mr. C. H. BELBEN, who retired by rotation, has, on the final polling, been re-elected an Employee Director of the South Metropolitan Gas Company by a majority of over 7000 votes.

Friends of Mr. W. P. TERVET will be glad to learn that he has received an appointment with the Tottenham District Light, Heat, and Power Company. He received his training with this Company; and, knowing him as they do, they look forward to his future with every confidence.

ELECTRICITY SUPPLY MEMORANDA.

READING between the lines, and giving due weight to the summonses in the electrical journals to electrical men to "wake up," we fear the "Wiring of Britain's Homes" campaign is not making that universal appeal which the promoters had hoped for. The idea has taken on in some areas, but not by a long way in all. The "Electrical Review" asks "Is London Awake?" It proceeds to show that its opinion is that it is not; for it would like to inflict a terrible ordeal upon the citizens of London. It believes it would be useful if it "could set all the sirens in the district going simultaneously to announce that the 'Wiring the Homes of Britain' campaign is making excellent progress everywhere else." Heaven forbid! Perhaps some of the undertakings would reply that they know their business better than the "Review" does; and they are content to wait for indulging in a stimulating period until they can undertake it without the burden of dear fuel and the drawback of higher priced current. The same week the "Electrical Times" stated that the pace of the progress of the campaign "is quite as fast as the promoters calculated would be the case." We must not place too much weight upon that statement, as the succeeding one is obviously the more important. "Efforts should be made to accelerate the pace, and every supply undertaking, contractor, and retail trader should get a supply of 'Home Lighting' books, and bring them to the notice of people who call on them. Equally important is it that electrical circles should be formed in every locality. To the enthusiastic, this constant reiteration of the needs of the situation may seem unnecessary, but we have heard of some extraordinary cases of apathy and ignorance." And again: "Individual effort in all directions is required, and to each engineer and contractor we would say: 'Don't wait for the other fellow to move.'" Singularly, the same week, the "Electrician" stated that the number of competition booklets disposed of had reached about 800,000; and it added: "Considering the time the campaign has been in operation, this result is not bad, but it will have to be improved upon very materially in coming weeks if proper advantage is to be taken of the business promoting possibilities of the electrical industry's great co-operative scheme." It is unnecessary to comment on this simultaneous boosting effort. At the same time, it is acknowledged that in some areas the scheme has taken good hold of those interested in the supply of electric appliances and energy; and they are engaged seriously in co-operative endeavour. But they could have done the same thing, had they chosen, without the launching of the scheme.

Backward in Participation.

An interesting letter appeared in the "Daily News" on the 30th ult., giving an account of personal experience with both gas and electricity for cooking purposes. The writer, who signed himself "Dum Spiro, Spero," stated that he is the owner of a small suburban house, half of which he lets unfurnished. His tenant uses gas for cooking purposes; he himself employs electricity. The cookers stand side by side. The lighting of the house is by electricity. Both families consist of husband and wife; and the writer says that his tenant does more cooking than he himself. The four quarters' accounts from Lady Day, 1925, to Lady Day, 1926, were as follows:

Gas and Electricity for Cooking.

	For Cooking Only.		
	Gas.		Electricity.
	£ s. d.		£ s. d.
	0 18 1	..	2 1 2
	1 1 6	..	1 19 10
	0 14 0	..	1 13 1
	0 17 1	..	2 2 1
Total . .	£3 10 8	..	£7 16 2

Thus electricity costs the householder 120 p.ct. more than the gas of his tenant, who indulges in a greater amount of cooking. The figures include hire of cookers and meter—viz., 6s. for gas, and 9s. 9d. for electricity. "Dum Spiro, Spero," considers that electric cooking is superior to gas cooking; but he thinks until the supply stations are more businesslike and up-to-date in their methods, electricity for domestic purposes will never be popular. The letter, of course, reveals a want of knowledge regarding the relative positions of the two agents. In the first place, all electrical appliances, owing to the great difference between the simplicity of those consuming gas and the complexity of those using electricity, must be more expensive to produce for a given capacity; and, as the potential heat value in a therm of gas requires 29 units of electricity to equal it, it will be impossible for electricity to be sold at a profitable price, so as to have equality with gas in respect of heating value for a given expenditure.

Cooker Maintenance.

The Peterborough Electricity Department have a cooker hire scheme, which the "Electrical Times" states has been responsible for an additional 341 new installations in a little over twelve months—making the number of cookers fixed 371. Maintenance is the point our contemporary deals with principally in an article on Peterborough's electric cooker experiences. A table is given of maintenance costs, which, having regard to the above figures, is a little confusing. The statement includes the costs of maintaining two types of cookers, 346 kettles, and small miscellaneous articles; and the total of all the items is given as £89 19s. 2d. This is described as the "total cost of maintenance for 346 cookers," although including 346 kettles. However, passing over those figures to others below, we see it stated that "the total number of cookers installed for twelve months was 308; the total cost of maintenance was £77 2s.; and the average cost of maintenance 5s." We ask our contemporary, Of what value are these figures as an index of the actual year-by-year cost of maintenance? The figures refer to the first year of installation when all is new; and the installations were made at various times during the year, and not all at the beginning, so that a good proportion of them could not have required any maintenance. Therefore the 5s. is not the average for a year's use of all the cookers, nor does it reflect what will be the cost with year-by-year use and depreciation. As a matter of fact, the Engineer considers that 10s. per annum would be a fair normal maintenance charge.

An All-Electric House.

The public love anything of a spectacular character. During the recent civic week at Liverpool, the Corporation Electricity Department organized an all-electric exhibition house; and in seven days, including two Saturdays, 49,963 people passed through it. With such a number, there could not have been much time for them to linger, examine, and interrogate the attendants regarding the merits of the fitments. However, the Department were pleased with the reception the house had, and so decided to keep it open for inspection for a fortnight longer. The floor area was within the limits laid down for subsidy houses—viz., 950 sq.ft. The house contained a hall, parlour, and living room on the ground floor, and two bedrooms (instead of three as would normally be the case if the house was for residential purposes) and an enlarged bathroom. No chimneys or ventilating flues were provided; so that the house was opposed to the canons laid down for health-protection purposes. The excuse is that chimney breasts are eliminated; thus giving more floor area. The gas industry can show how the same saving can be effected, and yet provide satisfactory ventilating flues. The house was built on the "Dominion" system of rapid permanent construction; the external walls having heat-retaining properties. The "Electrical Times" says that by the system a saving of "one-third of the fuel usually required is said to be assured—a factor of importance in all-electric operating." While there may be doubts regarding the first part of this statement, there will be complete unity of view respecting the second part. In con-

nection with "The Wiring of Britain's Homes" campaign, it is hoped to have a chain of all-electric houses through the country. We have not yet come across one; so that we suppose there are some breaks in the chain.

That 100 P.Ct. Efficiency.

An instructive article on the "Radiant Emission of Electric Fire-Bars" has appeared in the "Electrical Times" from the pen of Mr. Stanley F. Bickell, Assoc.M.Inst.E.E. We will not enter into all the considerations dealt with by Mr. Bickell, which he bases on the wave theory of heat and light. But in the opening of the article one or two points are made which are interesting; and it requires no mental exercise to appreciate them, as well as the practical character of the author. He points out that it is a safe assumption that few electric radiator elements have been designed with any thought to the fundamental principles of heat emission which are involved. The practice of manufacturers appears to be to select an electrical resistance, house it in a refractory base, operate it at a temperature as high as safety will permit, and consider that the result represents the maximum thermal radiant efficiency obtainable. The reason for this method is probably due to the widely circulated, but usually unqualified, statement that electric fires are 100 p.ct. efficient. While this is true of convector heaters operating at "black" heat, it is open to misconception when applied to radiators having any pretensions to luminosity. In a literal sense, it is intended to convey that an electrical resistance dissipates the whole of the energy supplied to it; but this is usually loosely construed as implying heat energy, which is erroneous. Mr. Bickell exposes also the supposition that the more elevated the temperature at which a body operates, the greater the heat emission for the same input. The fallacy of this is easily realized by the comparison of the heating effects of a 500-watt glow lamp and a 500-watt gasfilled lamp. In the former the energy supplied is dissipated largely in the form of heat; in the latter case, heat emission is reduced to a minimum, and luminous radiation encouraged. It becomes obvious therefore that heat emission varies inversely with the temperature after passing a certain maximum, and it is this maximum which it is necessary to locate. It is urged by the author that, in deciding the temperature at which a fire bar shall operate, there are two major points to be considered—the effect of the temperature upon the skin, and its effect upon the eye. A common maximum should be aimed at in each case. While this is actually impossible, a useful balance can be attained.

"Vitaglass."

Ultra-violet rays have long been suspected of being damaging to the eyes. No one now says they are not so. Sir William Crookes made a special glass for lenses to prevent their injurious effects, but we have a set-off to this arraignment of the ultra-violet rays. We are now told that they are health-giving, and this no one would be prepared to deny. Information regarding "Vitaglass" has recently had large prominence. This glass allows the ultra-violet rays to pass, while ordinary glass prevents their free passage—in fact, it is stated that the new glass permits the passage of 65 p.ct. of the vital rays of the sun, which are entirely cut-off by ordinary window glass. "Vitaglass" was discovered some two years ago by Mr. F. E. Lamplough, working in the Research Laboratories of Messrs. Chance Bros., Ltd., Birmingham, by whom the glass is now manufactured. It has been found that its use has an invigorating effect upon the monkeys and reptiles at the Zoo; and a large area of the glass is being placed over the lions' cages. We have never noticed that the monkeys required invigorating—they always appear to be as lively as is necessary. It is also stated that the glass has a very beneficial effect upon school children, and it is also being used in certain important hospitals—Dr. Saleeby and other eminent medical men recommending its use for both windows and lamps. It is now proposed to make electric lamp bulbs of the new glass. The Edison Swan Electric Company, Ltd., are making a 300-watt lamp which, it is expected, will be retailed at 27s. 6d. A lamp of such a size would be too large for ordinary domestic use; but it is believed that smaller ones will be manufactured when there has been further experience with the qualities of the glass for this particular purpose. If the glass is beneficial for electric lamps, why not for gas lamps?

Chambers of Commerce and the Bill.

The activities of the Chambers of Commerce in trying to secure amendments to the Electricity Bill do not appear to stand much chance of success. A deputation from the Association of British Chambers of Commerce recently had an interview with Lt.-Col. the Rt. Hon. Wilfrid Ashley, Minister of Transport. Information as to what transpired on that occasion has been made available by a meeting of the Council of the Leeds Chamber. The deputation urged upon Col. Ashley that clauses 5 and 7 of the Bill should be amended so as to leave the owners of selected stations in complete control of hours and methods of working, and plant extensions and alterations, subject, of course, to the provisions of the 1919 Act. They further submitted that authorized undertakings should be required to sell only their surplus energy to the Board, and that the costs of the Board (which should be purely administrative) should be charged in proportion to the total sales of the authorized undertakers. On behalf of the users of electricity, the view was expressed that the large undertakings are already carrying out the objects of the Bill. The power companies, for example, who are responsible for about one-quarter of the energy supplied in the country, charged an average price last year of 0·9d. per unit, which is about 0·1d. less than the promise of the Bill in 1940. It was also urged that the measure does not provide a sufficiently independent appeal tribunal. It appears that, in his reply, Col. Ashley viewed the suggested amendments as affecting really the kernel of the Bill, and that they would, to a large extent, mean its re-construction. He also stated that one of its objects was to provide a "marriage" (so to speak) between power companies and local authorities; and it is hoped that there will thus be closer co-operation between the two than exists at present. Mr. J. J. H. Stansfield (who, with Alderman Hugh Lupton, represented the Chamber at the interview) summed-up his impressions by saying that one must take the view that the Government are convinced that the Bill is a good one, and no promise was made to effect any alteration. However, the opinions of the Associated Chambers have not been modified in any way whatever by the discussion with Col. Ashley; and they see no reason for relaxing the efforts to convert the Bill into something which will be satisfactory—particularly in respect of the divorcing of capital ownership from management.

FORTHCOMING ENGAGEMENTS.

Nov. 11.—SOCIETY OF BRITISH GAS INDUSTRIES.—Autumn general meeting at the Hotel Cecil, under the presidency of Viscount Ednam, M.C.

Nov. 12.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—General meeting at the Hotel Cecil, Strand, W.C., at 2.15.

Nov. 13.—SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT).—Visit to the Phœnix Tube Works, Rutherglen, of Messrs. Stewarts & Lloyds, Ltd.

Nov. 13.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Visit to the Southall Works of the Gas Light and Coke Company.

Nov. 16.—GAS COMPANIES' PROTECTION ASSOCIATION.—Annual meeting at the Caxton Hall, Westminster, at 3 o'clock.

Nov. 18.—MIDLAND JUNIOR GAS ASSOCIATION.—Meeting at Birmingham. Paper by Mr. P. H. Wilson, of the Stanton Ironworks Company, Ltd.

Nov. 18.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—Meeting at No. 28, Grosvenor Gardens, S.W. 1, at 2.30.

Nov. 19.—EFFICIENCY CLUB.—Discussion on the Relative Fields and Merits of Gas and Electricity.—7.30 for 8. Vernon House, Park Place, St. James' Street, S.W.

Nov. 20.—YORKSHIRE JUNIOR GAS ASSOCIATION.—Meeting at Sheffield.

Nov. 20.—SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).—Visit to the Auchengeich Coke Ovens, Chryston.

Nov. 26.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Meeting at the Westminster Technical Institute. Paper by Mr. F. S. Larkin.

Dec. 4.—WALES AND MONMOUTHSHIRE JUNIOR GAS ASSOCIATION.—Joint visit with Western Junior Gas Association to the Beckton Works of the Gas Light and Coke Company.

Dec. 4.—SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).—Joint meeting with Eastern District, at Edinburgh. Paper by Mr. C. B. Tully.

Dec. 7-8.—INSTITUTION OF FUEL TECHNOLOGY.—Meeting.

Dec. 8.—MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.—Visit to the Stretford Gas-Works. Paper by Mr. J. Carr.

Dec. 8.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Visit to the works of Messrs. Parkinson & Cowan, Ltd.

Dec. 14.—NATIONAL GAS COUNCIL.—Meeting.

Dec. 14.—FEDERATION OF GAS EMPLOYERS.—Meeting.

Dec. 16.—MIDLAND JUNIOR GAS ASSOCIATION.—Meeting at Birmingham. Paper by Mr. A. Knight.

Dec. 17.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Meeting at the Westminster Technical Institute. Paper by Mr. C. M. Croft.

Feb. 16.—"B.C.G.A." MIDLAND DISTRICT CONFERENCE.

INSTITUTION OF GAS ENGINEERS.

Dec. 13.—Emergency Committee, Finance Committee.

Dec. 14.—Advisory Committee on Education.

SPONTANEOUS COMBUSTION OF COAL.

Most Readily Oxidizable Constituents.

Main conclusions of a research into the spontaneous combustion of coal, carried out by W. Francis and R. V. Wheeler, who show that the portion of the coal conglomerate which must be held responsible for its spontaneous combustion is the ulmin portion, and that the relative degree of liability of a particular coal, chemically, to spontaneous combustion can be estimated by determining the proportion and character of the ulmin compounds it contains.

Safety in Mines Research Board Paper No. 28* is an interesting account of work carried out by W. Francis and R. V. Wheeler on the spontaneous combustion of coal. The earlier investigators of the causes of spontaneous combustion of coal ascribed the absorption of oxygen and subsequent heating-up of the coal mass to the presence in it of iron pyrites. It was not until the researches of Richter, in 1868, that due regard was paid to the possibility of the coal substance itself oxidizing so rapidly at atmospheric temperature as to self-heat. Richter found that:

(1) Coal absorbs oxygen, part of which enters into combination with the coal substance, increasing its weight, while the other part forms carbon dioxide and water.
(2) The absorption of oxygen is continuous. There is a rapid initial rate of absorption, but this quickly gives place to a long-continued slow absorption.
(3) The oxidation is accompanied by the production of heat, and is accelerated by increased temperature.

Main Cause of Spontaneous Combustion.

The authors of this paper state that it is now recognized that, while on occasion the presence of pyrites may be a contributing or even a determining factor, the main cause of the spontaneous combustion of coal is the direct action of the oxygen of the air on the coal substance. The study of the spontaneous combustion of coal has therefore resolved itself into a study of the character of the reactions between oxygen and the coal substance at low temperatures.

The authors therefore set about to determine which compounds, among the many that constitute the coal conglomerate, are chiefly responsible for the attachment of oxygen. Coal is a conglomerate of widely differing compounds—a fact sufficiently evidenced by the readiness with which a bituminous coal can be divided, by means of organic solvents, into fractions which differ in general character. One coal may differ in general properties from another, partly by reason of the proportions of the different ingredients which compound the conglomerate—exemplified in a striking manner by the vitrain, clarain, and durain components of any banded bituminous coal—and partly by reason of modifications in the character of the ingredients, such as may determine the "rank" of a coal.

Line of Attack.

In attempting to determine the nature of the initial products of oxidation of coal, with a view to discovering which ingredient is the most readily oxidizable, the investigators directed their attention in the first place to the behaviour of the components of a banded bituminous coal. The coals used were from the Top Hard seam, Nottinghamshire (the vitrain, durain, and fusain portions), and the Parkgate seam, South Yorkshire (clarain portion).

It was found that prolonged oxidation by air at 150° C. transformed nearly the whole of the bright coals, the vitrain portion of the Top Hard and the clarain portion of the Parkgate, into ulmin compounds soluble in alkaline solutions. The dull coals, the durain and fusain portions of the Top Hard, were only rendered partly soluble; and further oxidation, even at a higher temperature, had little effect on the residue.

Examination of the insoluble residues showed them to consist (apart from mineral matter) entirely of plant entities. The characteristic and only plant residues from a vitrain were resin rodlets, which were obtained in small quantity from several different coals. From a clarain or a durain, the residues were chiefly spore exines and cuticles; while from a fusain they were carbonized woody tissues.

Reactive and Inert Compounds.

The authors of the paper refer to earlier work which showed that the difference, chemically, between the vitrain, clarain, durain, and fusain components of a bituminous coal lies in the proportion of relatively "inert" or unresponsive material with which a "reactive" portion is associated; the latter being of the same chemical nature in each component. The authors specify as the "reactive" group of compounds those which can be converted into alkali-soluble ulmins by mild oxidation. The "inert" compounds comprise the plant entities—whether resins, spore exines, cuticles, or woody tissues—which remain insoluble in alkalis after the ulmins have attained their maximum degree of solubility. It is stated that the portion of the coal conglomerate which must be held responsible for its spontaneous combustion is the ulmin portion.

Examination of Ulmin Portion.

The investigators carried out a chemical examination of the ulmin portion of several bituminous coals. A vitrain consists almost entirely of ulmin compounds; consequently vitrains were used for the major part of the work. The mode of attack was to break down the complicated molecular structures of the ulmin compounds by the use of a mild oxidant such as hydrogen peroxide or dilute nitric acid. In this way there were obtained recognizable products of known constitution and of sufficiently large molecular dimensions to enable the structure of the complicated ulmin molecule from which they were derived to be visualized. Such products are aliphatic dibasic acids, aromatic acids, and nitro-phenols, of which a number were isolated in pure crystalline form. Evidence was obtained that the nitrogen in bituminous coal exists for the most part in stable ring formation. It is therefore concluded that the nuclei of the ulmin molecules, which form the bulk of all bituminous coals, consist of compact systems of six-membered annular groupings connected together by heterocyclic structures such as pyrrole and furan.

Influence of Plant Entities.

Though initial oxidation of a coal is confined almost entirely, if not exclusively, to the ulmin portion, the plant entities, it is stated, by reason of their presence as "inert" substances, or because they affect the physical character of the coal, may influence its spontaneous combustion. The general characters of the various plant entities that can be isolated from the four components of a banded bituminous coal are briefly described in the paper, and an explanation is given of the fact that the bright portions of a seam are the most liable to spontaneous combustion—the fusain portion sometimes assisting.

Arising out of the research, it has been found possible to express the analysis of a coal in a form which indicates its properties more closely than either the proximate or the ultimate analysis. The authors give the following analysis of a Hamstead banded bituminous coal.

—	P.Ct. by Weight.			General Character of Plant Entities.
	Ulmin Compounds.	Organized Plant Entities.	Hydrocarbons and Resins.	
Vitrain . .	96	*Nil*	4	..
Clarain .	92	5	3	Cuticles and spore-exines.
Durain . .	83	15	2	Cuticles, spore-exines, and woody tissues.
Fusain . .	20	80	*Nil*	Woody tissues.

General Conclusions.

Among the majority of British bituminous coals, the character of the ulmin compounds they contain does not vary very much; but with coals of higher carbon content, in which the process of "coalification has proceeded further, the external groupings of the molecules have suffered condensation and dehydration, with the result that the ulmins are more stable and less readily attacked by oxygen. The readiness with which a given coal will oxidize and self-heat depends, chemically, therefore: (1) On the proportion of ulmin compounds it contains, and (2) on the degree of reactivity of those ulmin compounds as determined by the extent to which coalification has proceeded. The proportion of ulmins present in a coal can be determined, by difference, from the proportions of plant débris remaining after complete oxidation to form soluble ulmins has been effected; while a measure of the degree of coalification of the ulmins can be obtained by determining the proportion of alkali-soluble ulmins formed under standard conditions of limited oxidation. Thus both properties upon which the liability of a coal, chemically, to spontaneous combustion mainly depends can be given quantitative expression."

A Powerful Gas Lighthouse.—A photograph has been reproduced by the "American Gas Journal" of the huge prismatic lens, on exhibition at the Sesqui-Centennial Exposition, which has been in continuous service at the Navesink Lighthouse for ninety years. It is illuminated by three gas mantles, furnishes a light of a million candle power, and is visible from twenty to sixty miles, depending on atmospheric conditions.

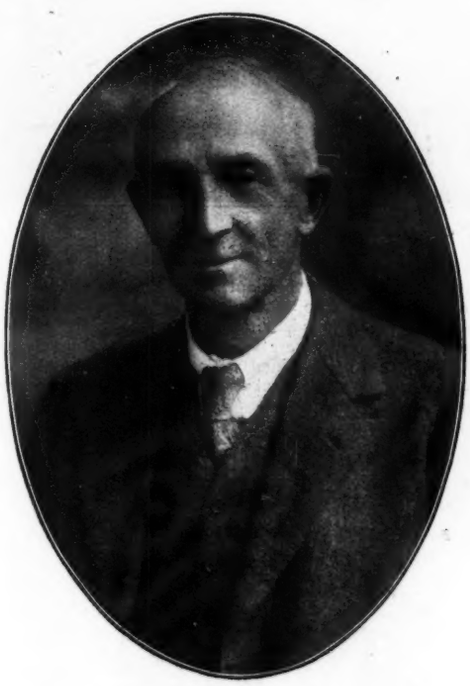
* "Spontaneous Combustion of Coal," by W. Francis and R. V. Wheeler. Safety in Mines Research Board Paper No. 28. Published by H.M. Stationery Office, Adastral House, Kingsway, W.C. 2; price 1s. 6d. net.

INTERMITTENT VERTICAL CHAMBERS AT RAMSGATE.

The First Plant of its Kind in this Country.

THE Borough of Ramsgate Gas and Water Department and their Engineer and Manager (Mr. R H. Ruthven) are to be congratulated upon the courage they have displayed in adopting, to meet their special requirements, a gas making plant which is the first of its precise pattern to be erected in this country, though there are numerous examples to be found in France, Holland, Germany, and Czecho-Slovakia. Judging from all that could be learned during the formal inauguration proceedings on Wednesday of last week, it is not likely long to remain the only installation here ; for it is a plant that would appear to be eminently suitable for those who are desirous of carbonizing what one may term "difficult" coals from the gas maker's point of view. It may be said, indeed, that Sir Arthur Duckham, K.C B , whose firm have been responsible for the erection of the plant, is himself absolutely confident that the intermittent vertical chambers referred to afford an admirable means of meeting the needs of those situated as Mr Ruthven is at Ramsgate.

Ramsgate, of course, was seriously affected by the war, and the consumption of gas dropped to practically one-half what it was before; but since that time satisfactory yearly increases have been recorded, with the result that now the make has almost recovered to its "previous best." This rapid recovery augurs well for the future of the undertaking, and suggests (together with information contained in a booklet prepared for last week's ceremony) the need for some such scheme as has now been carried out.



Alderman H. C. Child, J.P.,
Chairman of Gas and Water Accounts Committee.

In 1877 the works were acquired by the Local Authority, and immediately following this certain small extensions were carried out; but nothing further was done in this respect until 1890, with the exception of the provision of a larger station meter and a new Lancashire boiler. In the year named, Mr. W. A. Valon (who was then Engineer) carried through extensions to the retort house and coal store, which comprised the erection of another bench of horizontal retorts consisting of five additional beds capable of making, in all, 300,000 c.ft. of gas per day, or sufficient to meet the estimated increase in consumption for the following six years. The next big extension was foreshadowed in 1897, when a proposal was made to demolish the offices at the gas-works, and to build on the site a new retort house to yield an additional 500,000 c.ft. per day, which it was anticipated would be sufficient to meet the requirements of the next seven or eight years. This was carried out in 1900-1.

No new retort house construction work was undertaken between that time and the present developments; but from the manufacturing point of view an event of importance was the installation of a carburetted water gas plant by Messrs. Humphreys & Glasgow, Ltd., in 1921. This plant is capable of producing 400,000 c.ft. per day. In order to make room for it, a portion of the old bench erected in 1890 was demolished. In 1906 the need for greater gasholder capacity became apparent, and the present 800,000 c.ft. holder was erected by Messrs. Clayton, Sons, & Co., Ltd. The existing purifiers were put down in 1913 by Messrs. C. & W. Walker, Ltd.

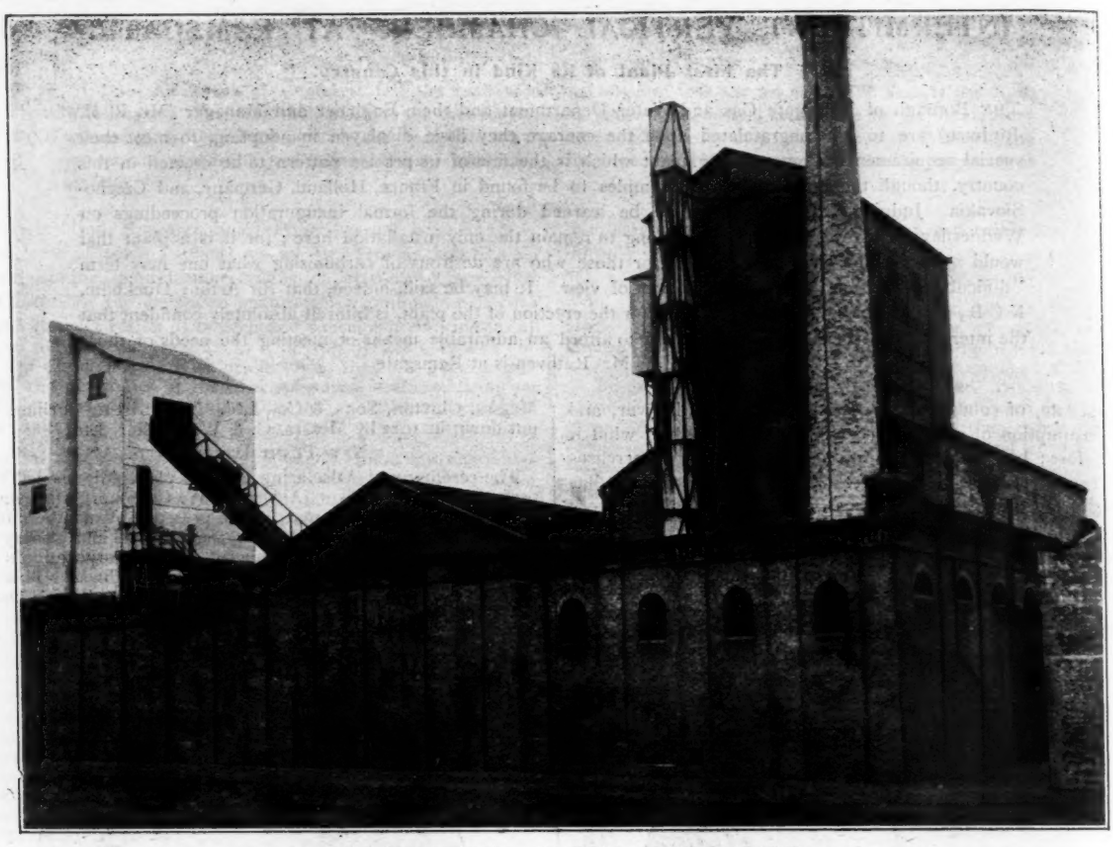
NEW PLANT INAUGURATED.

The ceremony of "declaring the new plant duly opened" was performed by the Mayor (Alderman W. Coleman), who was accompanied by the Mayoress, in the presence of members of the Council, who had assembled for the purpose in a roomy new power house that has been erected by the Corporation's own workmen, under the supervision of Mr. Ruthven. This contains a duplicate set of 80,000 c.ft. per hour Bryan-Donkin

R. Hy. Ruthven,
Engineer and Manager.

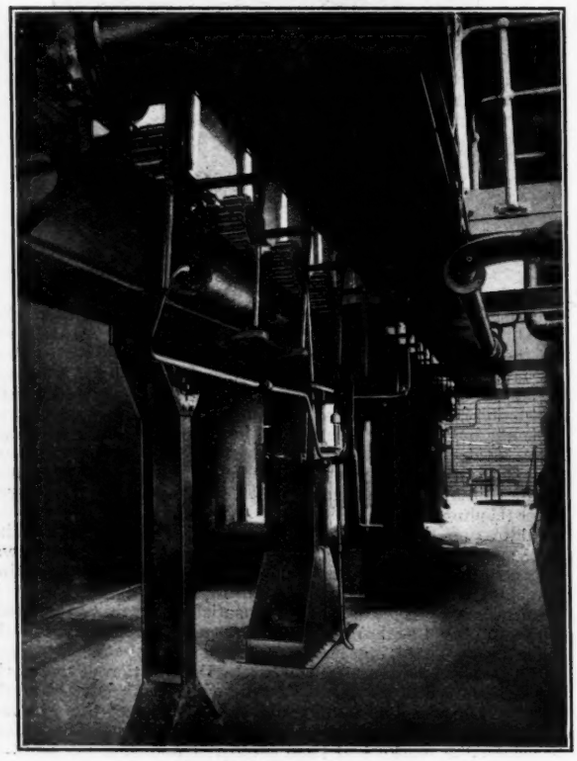
exhausters, which it was noticed are satisfactorily water lubricated. The house also contains the electricity generating sets for the new plant. The Chairman of the Gas and Water Committee (Alderman H. C. Child), who has rendered long and valuable service to the undertaking, and has entered wholeheartedly into the new scheme of extension, was, of course, present; but to the regret of all he announced that he would have, on doctor's orders, to retire, at any rate for a time, from Council work. The party also included the Deputy Chairman of the Committee (Councillor J. S. G. Langley) and the Mayor-Elect (Councillor F. C. Llewellyn).

Addressing those gathered around him, the Mayor said that in 1824 the Isle of Thanet Gas Light and Coke Company was incorporated by Act of Parliament to supply the towns of Margate and Ramsgate with gas. In 1876 the supply of gas in Ramsgate was regarded as so unsatisfactory that steps were taken by the Local Authority to acquire that portion of the undertaking supplying Ramsgate; and in 1877 the Ramsgate Local Board Act was passed, whereby that portion of the works was transferred to the Local Board. From that date the works had been in the hands of the Local Authority; the Margate works becoming an entirely separate undertaking. On various occasions the works had been improved and added to; but at the conclusion of the war it became necessary to consider extensive reconstruction of the carbonizing plant, which was be-

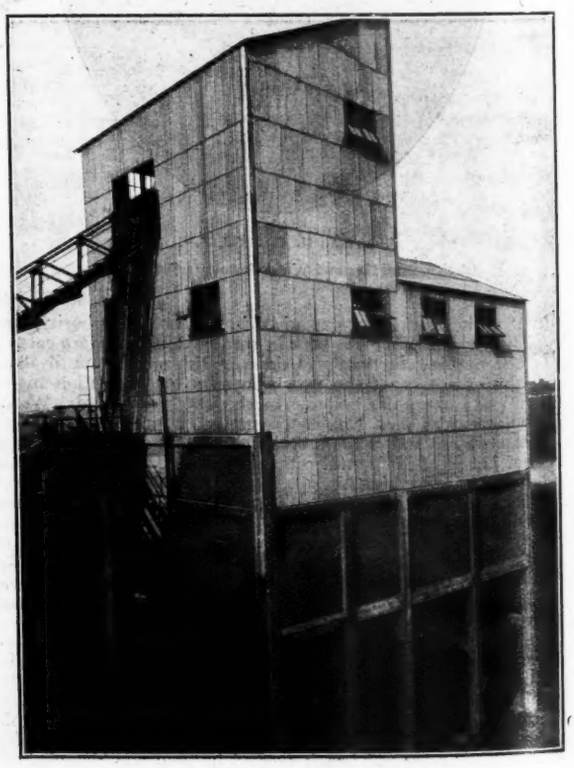


NEW INTERMITTENT VERTICAL CHAMBER PLANT.

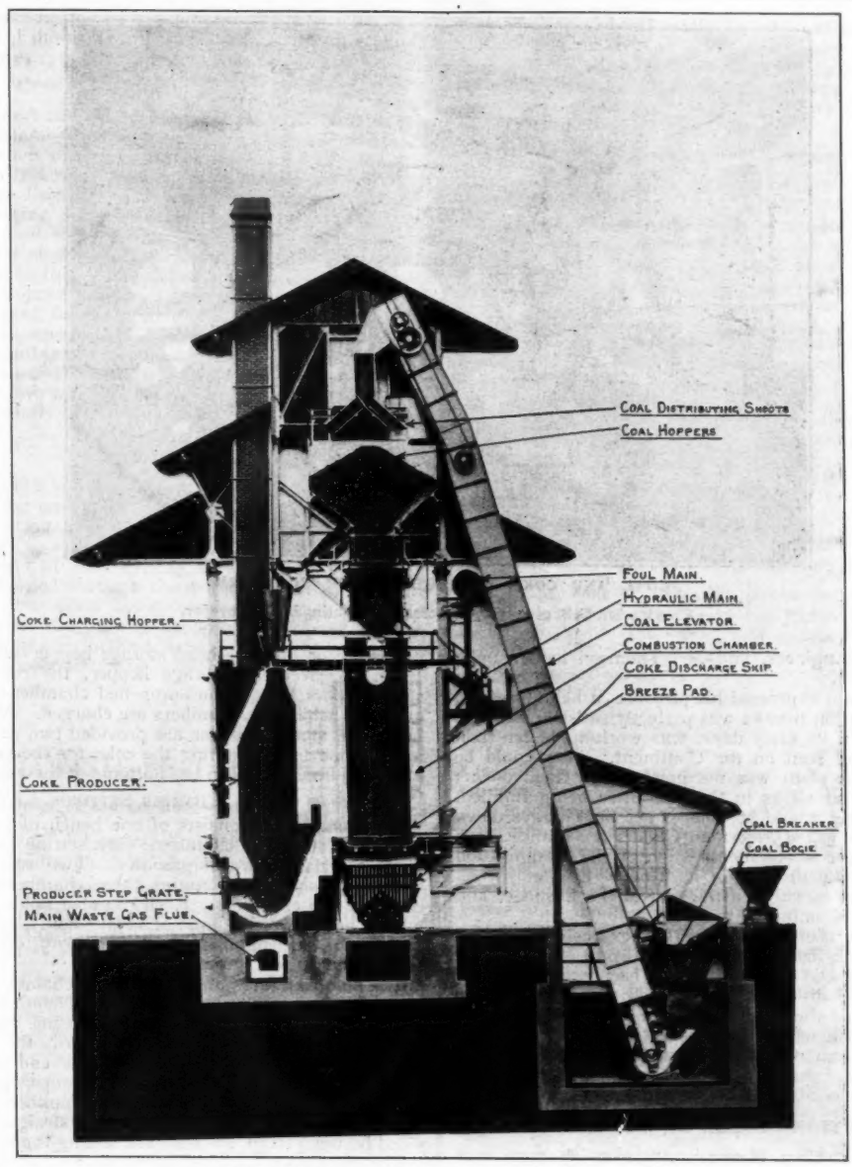
coming increasingly expensive to operate. In examining the most suitable plant to instal, a serious factor was the limited amount of ground space available, which precluded the use of modern horizontal settings of retorts operated by machinery. After careful consideration and inspection of various standard forms of carbonizing plants, it was decided that the most suitable plant for Ramsgate was an installation of Woodall-Duckham intermittent vertical chambers. This plant Mr. Ruthven advised them to adopt, to meet their special conditions, which, in addition to small ground space, included the desirability of being in a position to deal with any class of coal. Certain guarantees were given by the contractors as to the results that would be obtained with the plant; but as these were all in terms of Durham coal (which they were at present unable to obtain) it had not been possible so far to carry out the tests. When they saw the plant, he felt sure they would agree that it



Chamber House Floor Level.
Showing bottom door hydraulic operating mechanism.



Coke Screening Plant and Storage Hoppers.



DIAGRAMMATIC CROSS-SECTION THROUGH PLANT.

was all that it was claimed to be. They hoped, and fully believed, that when the tests were made the results would redound to the credit of the contractors; and that through the working of the plant the consumers would enjoy cheaper gas, while the rates benefited, as in the past, to the extent of £2000 or £3000 a year. ["Hear, hear."]

THE PLANT INSPECTED.

In February, 1925, the contract was placed with the Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., for the installation of fifteen chambers, in a portion of one of the existing horizontal retort houses, together with coal and coke handling plant, waste-heat boiler, and electricity generating sets; and the plant has been at work now for about six weeks, making the whole of the coal gas supplied to the town. A mere walk round such an installation would not convey a great deal to the lay mind; but, under the expert guidance of Sir Arthur Duckham, Mr. J. S. Jeffrey (of the Woodall-Duckham Company), and Mr. Ruthven, the visitors were able to gather quite enough to justify the many eulogistic comments that were made. This explanation of the working, too, was much simplified by a beautiful sectional model of the plant which the Woodall-Duckham Company had sent down for the occasion. There were five main reasons which governed the selection of the plant for Ramsgate; and they are set out in the booklet as follows:

MAIN REASONS FOR CHOICE OF PLANT.

1.—The small ground space required.
2.—The capability of the plant to carbonize any class of coal or slack, including that from the Kent coalfields.
3.—The suitability of the coke from this type of plant for meeting the already existing local requirements.
4.—The fact that a larger gas yield per ton of coal carbonized was guaranteed from intermittent vertical chambers than from horizontal retorts, due to the steaming of the charge during the last two hours of the carbonizing period.
5.—Economy of operation.

All these advantages, of course, were not apparent from the inspection; but the small ground space required certainly was. So were the vastly ameliorated labour conditions, as compared with those necessarily prevailing in the works hitherto. Again, the substantial construction throughout was observable; and the visitors saw the excellent appearance of the coke as it was discharged in one cake from a chamber. The quenching tower and the automatic coke hoist were items of great interest; and, with all there was to be seen, Sir Arthur Duckham was able to give the assurance that "Mr. Ruthven has not spent a shilling which he cannot see a return for."

THE CHAIRMAN AND ENGINEER.

Subsequently in the gas offices tea was served, and some felicitous speeches were made. Alderman Child said that before the plant was put up he remarked to Sir Arthur Duckham: "Do not for goodness sake let down our Engineer." Their Engineer was a young man who had his way to make in the world; and there was no doubt he would do it. So far as Ramsgate was concerned, he had never proved wrong yet, and he (the speaker) hoped that his ability would be recognized. The Committee had absolute faith in the firm who had carried out the work; and already people had been along from other towns to examine the plant. He thanked Sir Arthur Duckham for the manner in which his firm had carried out their contract; and he thanked the Engineer, the staff, and the workmen for all they had done. The Mayor also spoke of the Corporation's indebtedness to the Woodall-Duckham Company and the Engineer. Mr. Ruthven, he said, was with them during Mr.

COAL AND COKE STORAGE HOPPER PLATFORM.

Showing lift, G.B. conveyor, and cross distributing band conveyor.

Thomson's time as Engineer, and Mr. Thomson looked upon him as a coming man.

Sir Arthur Duckham expressed his pleasure at being present, and told the Corporation that he was perfectly satisfied with the plant, which, even in its early days, was working better than similar plants he had seen on the Continent. They could be quite certain that the plant was not going to let them down; and he had no fear at all as to the guarantee being fulfilled. Probably the Engineer would be able to get the charges down to eleven hours. He asked Alderman Child's acceptance of an inscribed silver salver, in commemoration of the inauguration of a plant which, being the first of its kind in England, it required a good deal of courage on the part of the Engineer and the Chairman of the Committee to adopt.

After other members of the Council had expressed their appreciation of the work that had been carried out, Mr. Ruthven was called upon, and said the contract had been executed under the most pleasant conditions. He thanked the whole of the staff and the men for the loyal assistance they had rendered. The Deputy Chairman of the Committee voiced the regret of the members at Alderman Child's retirement from the Chairmanship; and a vote of thanks was accorded the Mayor and the Chairman, on the proposition of Councillor T. H. Prestedge.

DESCRIPTION OF THE NEW PLANT.

Coal Handling.

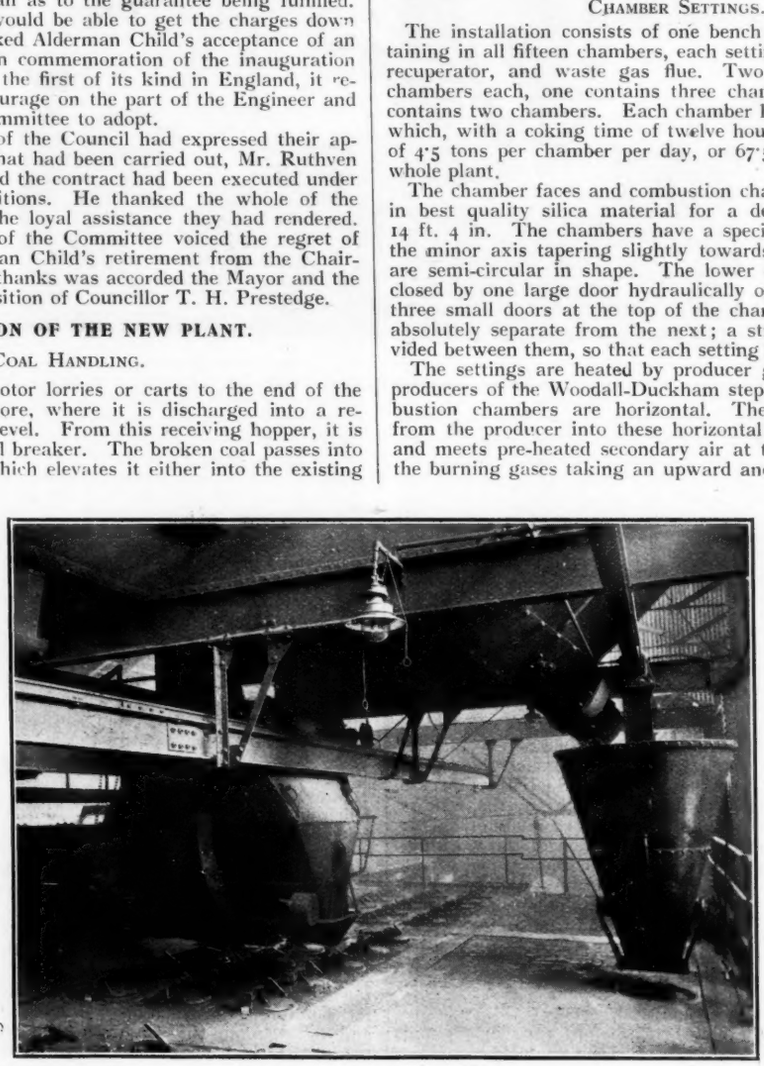
Coal is brought in motor lorries or carts to the end of the already existing coal store, where it is discharged into a receiving hopper at yard level. From this receiving hopper, it is fed into a single-roll coal breaker. The broken coal passes into a lip-bucket elevator, which elevates it either into the existing coal store or into overhead storage hoppers above the settings From the overhead storage hopper, the coal is fed through sliding doors into a hand-propelled chamber-charging skip, by means of which the chambers are charged. Alongside the overhead coal storage hopper are provided two additional compartments—one for containing the coke for the producers, and the other the breeze used in the bottoms of the chambers.

Chamber Settings.

The installation consists of one bench of four settings, containing in all fifteen chambers, each setting including producer, recuperator, and waste gas flue. Two settings contain five chambers each, one contains three chambers, and the fourth contains two chambers. Each chamber holds 2·25 tons of coal, which, with a coking time of twelve hours, gives a throughput of 4·5 tons per chamber per day, or 67·5 tons per day for the whole plant.

The chamber faces and combustion chambers are constructed in best quality silica material for a depth of approximately 14 ft. 4 in. The chambers have a special ovate cross-section; the minor axis tapering slightly towards the two ends, which are semi-circular in shape. The lower end of the chamber is closed by one large door hydraulically operated; but there are three small doors at the top of the chamber. Each setting is absolutely separate from the next; a straight joint being provided between them, so that each setting is entirely independent.

The settings are heated by producer gas, which is made in producers of the Woodall-Duckham step-grate type. The combustion chambers are horizontal. The producer gas passes from the producer into these horizontal combustion chambers, and meets pre-heated secondary air at the lower heating flue; the burning gases taking an upward and sinuous course. The



TOP OF SETTING PLATFORM.

Showing coal charging machine and producer charging machine.

secondary air is pre-heated in recuperators built in with each setting. The top of the setting and the front walls are insulated to reduce heat losses.

OPERATION OF THE PLANT.

In order to protect the bottom door, a pad of coke breeze is charged into the chamber. To effect this, a small compartment is provided in the side of the chamber charging skip.

The operation of charging a chamber is as follows: After the chamber has been discharged, and the bottom door tightened, the chamber charging skip, with its complement of coal and breeze, is put in position. A framework is dropped in position over the three top doors of the chamber, and the breeze is allowed to drop into the chamber through the three openings. The coal is then dropped into the chamber, but only through the two outer openings; the attendant smoke and dust passing through the centre opening to the hood and chimney. When the coal in the chamber is carbonized, the charge is removed by opening the bottom door, which is hydraulically operated.

During the last two hours, the charge in the chamber may be steamed, which results in an increased thermal yield per ton of coal.

COKE HANDLING.

The hot coke drops without manual help from the chambers into a skip running on rails fixed in the chamber house floor underneath the settings. The skip is electrically hauled to one end of the settings to a quenching tower, in which the coke is quenched by means of an overhead spray. After quenching, the coke is discharged through the bottom doors of the skip into a concrete hopper under the quenching tower.

From this hopper, the coke is fed into the skip of an electrically-driven automatic inclined hoist. The skip carries the coke to an outside coke breaking, screening, and storage plant, and discharges it automatically into a receiving hopper. From this hopper, the coke passes on to a rotary grizzly screen, which separates the coke over and through a 2 in. mesh. The large coke is either broken or stored, the small coke is graded into three further sizes by means of a rotary screen, and falls into separate compartments.

WASTE-HEAT BOILER.

In order to utilize the major portion of the heat in the waste gases after they leave the settings, and before they enter the chimney, a "W-D" fire-tube waste-heat boiler is installed, raising steam at 120 lbs. per sq. in. When all the fifteen chambers are working the boiler is capable of generating 2500 lbs. of steam per hour from and at 212° Fahr. The waste-heat boiler installation includes a feed water heater of the closed tubular type working on exhaust steam, two feed water pumps, an induced draught fan driven by means of a vertical high-speed steam engine, and a superheater.

ELECTRICAL GENERATING PLANT.

For producing the current for operating the electric motors driving the plant, two electric generating sets are installed, one to act as a stand-by. One set, capable of developing 40 KW. at 225 volts, consists of a Browett-Lindley vertical steam engine direct coupled to a Lancashire Dynamo Company protected type generator. The second set consists of a "National" gas engine direct coupled to a similar dynamo set.

HYDRAULIC POWER PLANT.

For provision of hydraulic power for the operation of the bottom doors of the chambers, two hydraulic pumps, one acting as a stand-by to the other, and a hydraulic accumulator are provided. The hydraulic power is supplied at a pressure of 550 lbs. per sq. in.

NOVEL WASTE-HEAT BOILER.

Principles of the La Mont Generator.

The La Mont boiler* for generating steam for water gas sets is an American production. The principle, which is simple, lies in the injection of a small quantity of water into the top of a long tube, $\frac{5}{8}$ in. in diameter, in such a manner that the water strikes the sides of the tube and is held as a film to the interior of the thin heated metal wall by adhesion of the water particles to the metal and the cohesion of the particles to each other, creating a hollow centre for the passage of the steam thrown from the film. As only part of the water is turned into steam, the remaining water, together with the steam formed, issues from the lower end of the tube, and passes into a collecting pot and thence through a separator. The steam then passes through a non-return stop valve to the main steam line. The $\frac{5}{8}$ in. tubes are 25 ft. long, and are grouped in trays. As many of these trays as are necessary are placed $\frac{1}{2}$ in. apart, parallel to each other, and with the tubes staggered. Headers are placed at top and bottom of the trays. The close spacing of the tube heating surface gives high velocity of gas travel, which helps to keep the outer surface clean, and renders heat transfer more effective.

The unevaporated water which has been heated leaves the separator, and is sent to the water level pots, carrying with it any carbonates or sulphates or scale-forming matter, or foreign substances which may have been precipitated in their passage through the heating surface. This unevaporated hot water mixes with the entering cool feed in the water level pot, there precipitating the carbonates and sulphates outside the tubes. This mixture of hot water and cool feed is picked up by a pump, together with any remaining scale-forming matter. It is then passed through a screen, and is returned to the top of the tubes, where it is injected.

INSTALLATION IN AMERICA.

In 1925 a La Mont generator was put into operation in connection with a large water gas plant in the United States. It receives waste heat from the blow period of $2\frac{1}{2}$ minutes; the gas making period being $3\frac{1}{2}$ minutes. The installation is operated with a double set of "clapper" valves—one at the outlet on the top of the generator, and the other at the intake. Steam is made from cold on the first or second blow.

The new La Mont generator weighs about 25 tons with water, is 5 ft. in diameter, and approximately 35 ft. high. It is mounted on three supporting steel columns, and can, if necessary, be erected directly over the superheater of a water gas set.

* Marketed by the La Mont Corporation, 200, Fifth Avenue, New York City.

PULVERIZED COAL FIRING.

Members of the Institution of Fuel Economy Engineers met at the Royal Society of Arts, Adelphi, on Friday evening, Nov. 5, for the purpose of hearing a paper by Mr. R. Jackson, of Coventry, on the subject of "Pulverized Coal," with particular reference to the unit system.

The following conditions should, according to the author, be complied with in order to obtain good results when burning pulverized coal:

(1) The coal dust must be in a finely divided state, exposing a maximum amount of surface to oxydizing influence.
(2) The size of the particles should be such that they may be completely consumed in a definite time period.
(3) The velocity of the conveying air must be adequate to sustain and convey the coal particles, and must be higher than the velocity of flame propagation.

The position in industry of the present storage or central system is, said Mr. Jackson, being definitely challenged by the unit or self-contained mill, which is capable of combining all the coal preparing operations within the compass of a single machine. The unit system is now entirely dependable, and is available, not only where fuel requirements are relatively small, but for capacities up to 5 tons of coal an hour. One of the advantages of this system, as compared with the older one, is the saving in capital cost; while the operating charges are also much lower. With the "Atritor" system, to which reference was made, it appeared that the power required is much lower than with any of the central systems. It has been proved by Dr. Lulofs, of Amsterdam, that boiler efficiencies of over 90 p.ct. can be obtained by means of the unit method.

Numerous advantages of burning coal in pulverized form were set out in the paper; the first being that the coal can be burned in the most efficient manner, and that this is coupled with easy control and regulation. Mr. Jackson is convinced that the use of pulverized coal has come to stay.

Electrically Operated Flow Meter.—There is an illustrated account in the "Engineer" for Nov. 5 of an electrically operated flow meter for indicating, recording, or integrating the rate of flow of steam, water, gas, or other fluid, for which the makers—the Brown Instrument Company, of Philadelphia—claim certain important advantages. The meter is stated to be so designed that fluctuations in the voltage of the current supplied to it are without effect on the readings, and as a consequence no voltage regulator is required. All the electrical parts and connections are external to the pressure chamber; there are no electrical contacts dipping into mercury; and there are no bushings which have to be made tight against the fluid pressure. The agents for the meter in Great Britain are the Lovick Johnson Company, 5, Montana Road, London, S.W. 17.

MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.

Visit to Huddersfield.

Members of the Association to the number of about fifty visited Huddersfield on Nov. 3. They went first to the gas-works, where they were received by the Gas Engineer (Mr. H. Singleton) and his Chairman (Alderman R. Mitchell, Mayor-Elect of Huddersfield). In a few well-chosen words, the Chairman gave them a hearty welcome, and expressed his regrets that the visit would have to be so brief, as there was much to be seen at the works. In the last year or two they had spent some £240,000 on maintaining the efficiency of the plant; and the whole of this sum had come out of revenue. Under the guidance of the Gas Engineer, and Messrs. T. Dyson, B. Thorpe, and H. Noble, the party then made an interesting tour of the works.

THE GAS-WORKS.

The new carbonizing plant consists of nine arches, five of which are filled with horizontal retorts, each 23 ft. long, in beds of ten retorts in each arch. Four arches have built-in strut walls for support until the new settings are put in. The producers are 13 ft. deep, fitted with step grates. The fronts of the settings; as well as the producers, are provided with insulating bricks. The furnace lids are of the balanced type; and the discharging and charging machines are of Drakes' pattern. The hot coke is removed by De Brouwer chain in a trough provided with automatic quenching apparatus, in front of the bench, from which it is arranged that a cross conveyor shall convey the coke to " Cascade " screens fixed above the storage hoppers, which are arranged with bagging shoots, as well as for loading into motor and railway wagons.

On the other side of the house is a coal tipping plant, together with the usual breakers, elevators, and 48 hours' coal hoppers. The whole of this plant is in a house which previously contained 24 beds of inclined retorts. The purifiers and purifier house are of reinforced concrete. The coke handling plant in the older retort house is on the lines of a modified telpher, with self-discharging skip; the quenching being performed automatically on the drag-bar conveyor.

The sulphate of ammonia plant produces 5 tons a day. The tar works were inspected, where complete distillation, as well as the making of prepared tar, was being carried out. There is installed pneumatic oxide handling plant to deal with 10 tons of oxide an hour.

MESSRS. W. C. HOLMES & CO., LTD.

Subsequently the party proceeded to the works of Messrs. W. C. Holmes & Co.; and here they were received and conducted over the establishment by Messrs. P. Holmes, J. Whittle, W. Crosley, C. Cooper, and C. Hanson.

Founded in the year 1850 by the late Mr. W. Cartwright Holmes, the firm were one of the first engineering concerns to devote their activities exclusively to the requirements of the gas and allied chemical industries. Within a few years, over three hundred areas were provided with complete equipment by Messrs. W. C. Holmes & Co., and in addition a large number of towns and villages in France, Germany, Russia, &c. Very few of these plants are in existence to-day; but from the drawings and other documents still at Turnbridge, it can be seen that much ingenuity was exercised to produce small units for carbonizing and purifying, to combine compactness and simplicity with the advantages of continuous operation and easy control of larger installations.

The firm's activities now cover the manufacture of iron and steel work construction of every description found on gas-works and coke oven plants. Several large installations of complete condensing, tar extracting, and ammonia and benzole recovery plants (of which those at the new coke ovens of the Shelton Iron-Works, Stoke-on-Trent, and the new Partington Gas-Works of the Manchester Corporation are notable examples) have recently been undertaken. Patents taken out in 1855 and 1858 covering improvements in gas washing and purifying apparatus marked the determination to concentrate on the improvement in means of securing the supply of a " pure " gas to the consumer. Later patents deal with the introduction of the Holmes' " brush " rotary washer.

All wrought-iron and steel work construction is carried out in two lofty shops, each 48 ft. wide by 200 ft. long. Bay No. 1 is reserved chiefly for assembling, riveting and caulking, and also houses the air compressors and pumps and accumulator for the pneumatic and hydraulic tools. Bay No. 2 is equipped with four Asquith radial plate drills, with individual electric motor drive served by overhead electrically operated travelling crane. The smiths' forges, plate and bar furnace, hydraulic press, and punching, shearing, and section handling machines are located in the north end of this bay. A complete welding equipment is installed, and occupies the south end; and recently additions have been made to meet the demand for pressed-steel electrically welded specials, pipes for by-passes, &c. A number of portable acetylene generators are also in use for cutting and welding.

In the yard are sheds containing bar straightening and cold sawing machines, and a separate building is devoted to marking out, template making, and storage. The yard is served by two steam loco cranes. The foundry consists of a building 210 ft. long in two spans, one of which is 50 ft. wide, and the other 30 ft. The equipment comprises two cupolas, the larger having a capacity of 7 tons per hour, and the smaller 3 tons per hour. For the drying of the cores for the various castings three large core stoves, heated by coke fires, are provided.

The pattern shop and pattern store are adjacent to the foundry. The mechanics' shops include machine shop, fitting shop, and erecting shop, and cover a total space of 212 ft. by 85 ft. The largest of the three bays forms the heavy machine shop and erecting shop, and is spanned by two 5-ton electric cranes. The machines are arranged down two sides of the shop, those on each side being driven by separate motors, in addition to which there are several independent motor-driven tools. Specially designed planing machines and vertical boring and facing machines and lathes have recently been installed to finish with speed and accuracy castings such as are used in the construction of purifiers, condensers, rotary washers, &c. Castings of the largest size accepted by the railway companies in cylindrical and rectangular form are faced and drilled on these machines. The north end of the third bay is devoted to the assembling and testing of gas valves; special facilities being provided for the storage of parts and rapid grinding-in and testing operations to enable customers' special requirements in all types of " Western " valves to be met with the minimum of delay.

Extensions recently made at the north end of the works provide for yard space and sheds for storage of erectors' tackle and tools, and extra floor space in the erection shop. A further extension at the south accommodates additional boring and planing machines as well as offices.

The members left by special omnibuses, and saw the low-pressure high-power lighting in several thoroughfares on their way to tea (as guests of the firm) at Whiteley's café in Westgate. Mr. W. H. Battersby (President), in acknowledging the welcome by the Chairman of the Gas Committee, said they much appreciated the presence of the Mayor-Elect. A vote of thanks was passed to the hosts for their welcome and hospitality; and to this Mr. Holmes and Mr. Singleton replied.

GLOVER-WEST VERTICAL RETORTS.

Recent Contracts.

Those gas engineers who have found themselves during the difficult period of the coal dispute in possession of an installation of continuous vertical retorts with steaming facilities have been in a fortunate position. They have been able to meet the unprecedented demands for gas with the minimum quantity of such coals as have been available, and they have been able to vary carbonizing conditions to suit the many various kinds of coal from America and the Continent which they have been called upon to carbonize. No doubt these advantages, coupled with the increased sales of gas in all quarters, are responsible for the comparatively large number of contracts placed recently for Glover-West vertical retorts.

Since the date of the stoppage in the coalfields—that is, since May 1—no fewer than seven contracts in this country, and four abroad, have been placed with West's Gas Improvement Company for vertical retort installations. These include contracts with the gas undertakings at Stoke-on-Trent, for carbonizing plant of a daily capacity of 3¾ millions, with a complete coal and coke handling plant, retort house building and foundations, electric generating plant, and waste-heat recovery apparatus; at Altrincham, for carbonizing plant of a daily capacity of 500,000 c.ft., coal and coke handling plant, and retort house building and foundations; and at Bedford, for plant of a daily capacity of 1,280,000 c.ft., with coal and coke handling plant and retort house building. There are also important contracts abroad, including the addition of a ninth setting to the Toronto installation, the completion of the Wellington (N.Z.) installation, a new installation of forty " New Model " retorts of the large type for the Springfield (Mass.) undertaking, and an installation for Manly (Australia), comprising sixteen large " New Model " retorts with waste-heat recovery plant. And there are extensions of existing installations of Glover-West vertical retorts in this country. Eight retorts are to be added to the installation at Coatbridge; the Rochdale installation, which has been in operation since 1911, is being reconstructed on the " New Model," and the coal and coke handling plant is also being brought up-to-date; and eight retorts of the large " New Model " are being added to the Bangor (Co. Down) installation, this being the second extension.

THE SMOKE ABATEMENT BILL.

Correspondence with the Ministry of Health.

In the course of the lecture delivered by Dr. C. W. Saleeby on the eve of the Annual Conference of the British Commercial Gas Association at Newcastle-upon-Tyne (as reported in our last issue), he made reference to points in correspondence which he had had with Mr. Neville Chamberlain, Minister of Health. That correspondence is of such a valuable nature that we think it should be in the possession of all concerned in the gas industry, and all interested in the important subject of the purification of the atmosphere. The arguments advanced in the letters by Dr. Saleeby are of a nature which should be invaluable for discussion purposes in every gas-supply area in relation to the subject of obtaining legislative help for the progressive abatement of domestic smoke. In view of this, no apology is needed for reproducing the correspondence *in extenso*.

Dr. Saleeby (for the Sunlight League) to the Minister of Health.

The Sunlight League,
Carnegie House,
117, Piccadilly,
London, W. 1.
July 1, 1926.

SMOKE ABATEMENT BILL.

DEAR MR. CHAMBERLAIN,—While welcoming the Public Health (Smoke Abatement) Bill in general, there are certain respects in which it appears to us to accomplish or promise less abatement of the smoke evil than we believe to be practicable.

Accordingly we beg your consideration of the following points, to which we attach the utmost importance.

Clause 1 (1) (*e*).—We submit that this exempting clause is in reality unnecessary in view of the complete protection against the imposition of new burdens afforded to all industries by Clause 1 (4). We would point out that by this sub-section the position is actually made worse than under the present law in respect of nuisances caused by the processes specified in the sub-section. We understand that the Government is pledged to the temporary exemption of metalliferous processes, to which we take exception. If this be so, we submit that the Government should make clear its intention to regard the five-year period of exemption as a maximum, and that the Minister should undertake to exercise his powers under the last paragraph of the sub-section at the expiration of five years. We also protest strongly against the provision whereby the Minister may extend the exemption to other industrial processes without qualification.

Clause 2 (1).—We would urge upon the Minister the importance of making clear his intention to exercise his powers under this clause, without delay, if any local authority unreasonably omits to make by-laws of a satisfactory character.

Clause 5.—We desire to protest particularly strongly against the inclusion of the words "other than private dwelling-houses" in this clause. We submit that these words should be deleted, and the words "or cooking" added after the word "heating," for the following reasons:

(1) Domestic smoke is responsible for more than half of the smoke from which this country suffers.

(2) Local authorities already have, and employ, powers, in submitting schemes under the Housing Act, to make provision for such arrangements for heating and cooking as are calculated to prevent or reduce the emission of smoke. It is invidious and illogical that local authorities should have power to apply such regulations to new dwelling-houses of one class only.

(3) The argument, employed on behalf of the Government in the House of Lords, that "the spontaneous adoption of smokeless methods is progressing very favourably" is not an argument for inaction; on the contrary, it proves the reasonableness and practicability of pressing for a wider extension of the various smokeless methods available.

(4) There is no reason to suppose that local authorities, if given powers to deal with new dwelling-houses under this clause, would make too drastic or impracticable by-laws. They have not tended to do so in respect of subsidy-houses; and in any event the Minister need not, and obviously would not, confirm such over-drastic by-laws.

(5) It is unreasonable that, while industry generally is prepared to accept this Bill, with few reservations, and is, through the Federation of British Industries, adopting a progressive attitude, progressive local authorities should be refused even the power to make reasonable demands upon the private builder with a view to reducing the smoke nuisance so far as the domestic chimney is to blame.

Clause 7.—We submit that the Minister should make provision in the Bill for effective action to be taken in the event of the failure of the Council of a County Borough to carry out its duties in respect of smoke nuisances.

Clause 10.—We submit that some more effective and convincing method of abating the emission of smoke from Government premises should be devised, in view of the enormous value of an example set by the Government both to local authorities and to private individuals.—Yours faithfully,

(Signed) C. W. SALEEBY.

The Private Secretary to the Minister of Health to Dr. C. W. Saleeby.

Ministry of Health,
Whitehall, S.W. 1.
July 22, 1926.

DEAR SIR,—I am desired by Mr. Chamberlain to say that he has given careful consideration to the memorandum submitted with your letter of July 1 on the Smoke Abatement Bill, on which he makes the following comments.

Clause 1 (1) (*e*).—It is a mistake to say that this clause is "unnecessary in view of the complete protection against the imposition of new burdens afforded to all industries by Clause 1 (4)" (it is presumed that the reference is to Clause 1 (3)). The defence made available by that sub-clause is only in respect of smoke that is not black.

The present position is that the provisions of the law with regard to smoke abatement are not in fact enforced and, according to reliable evidence, cannot in practice be enforced in the case of certain industrial processes. In such cases it is clearly desirable that there should be express exemption, with any safeguards which are practicable; the result of having a law which cannot be enforced is to weaken the effect of the law.

The industrial processes expressly mentioned in the sub-clause are certain metalliferous processes in respect of which the Minister is satisfied that there is a sufficient case for their inclusion. It appears to him right that there should be means of exempting also other industrial processes in the same position. But there is no intention of exempting any industrial processes unless an adequate case for this course is made out; and any extension of the exemption will have to be confirmed by Parliament.

The extent to which any exemption can be removed must evidently depend upon how far means have been devised for preventing a smoke nuisance in connection with the particular processes, and how far it is practicable to enforce the adoption of such means. It is, therefore, not possible for the Minister to undertake that the five-year period mentioned in the sub-clause is to be a maximum; but it is his firm intention that processes in respect of which exemption is given shall be removed from their preferential position as soon as the conditions reasonably permit. The sub-clause provides means by which this can be done.

Clause 2 (1) expressly enables the Minister of Health to require a local authority to make by-laws; and it is his intention to use this power, where its exercise is required, in the public interest.

Clause 5.—This is a matter to which the Minister has given much thought, and he is considering it further in the light of representations which have been made to him. In the meantime, he wishes me to point out that there are a number of objections to the amendments which are proposed.

While it is quite true that the domestic chimney is responsible for most of the smoke evil, it must be remembered that no one has suggested the practicability of dealing with existing grates, which, of course, far exceed those in new houses. The possibilities are therefore confined to the latter. So far as houses provided by local authorities are concerned, the majority of them are already equipped with gas or electricity or both. It has to be borne in mind, however, that out of more than 670,000 dwellings erected since the war, about two-thirds have been built by private enterprise; and important as is the smoke problem, that of housing is still more vital, and we must be very careful not to do anything which would set back the progress which is now being made.

In matters of this kind, especially where they touch home conditions so closely, it is essential to take account of general sentiment; and experience under the housing schemes shows that there are limits to the extent to which it is possible to induce householders to adopt methods of heating to which they are not used. Moreover, the proposed amendment appears to the Minister to be open to the further objection of differentiating between individuals, which is condemned in the memorandum as invidious and illogical. Persons living in existing houses will be allowed to have an open grate, while persons in new houses, subject to the by-laws, would be restrained. The distinction would be the more invidious because at the present time smokeless methods of heating are usually more costly, particularly in some districts, than the use of coal; and while this additional cost may be a matter of little importance to the well-to-do, it may be a matter of moment to others.

The fact is that the difficult problem of domestic smoke cannot be solved until means have been devised for reducing the smoke from existing grates; and, therefore, so far as the domestic problem is concerned, the Minister is strongly of opinion that the line of progress (in addition to fostering the use of gas and electricity) is in the direction of discovering a smokeless fuel which can be retailed at a low price, and can be used in the ordinary grate, and the Government are spending a great deal of money in researches to this end.

Clause 7.—The Smoke Bill is to be read as one with the Public Health Acts (see Clause 11). The Public Health Act of 1875 (Section 299) contains powers under which the Minister of Health may take action in the case of any local authority which is in default.

Clause 10.—It is not clear to the Minister what precisely you have in mind. The clause puts a definite obligation on the Government Department concerned to observe the standard set out in the law. If the Minister in charge of the Department fails to carry out his duty in this respect, he is responsible to Parliament; and it is for Parliament to take him to task for any failure. There are constitutional difficulties in the way of applying the law to establish-

ments of the Crown in the same way as to private establishments; and the Minister wishes me to refer you, on this point, to the debate on this clause which took place in the House of Lords.

In conclusion, the Minister desires me to assure you that he is anxious to do all that is reasonably possible to reduce the smoke evil. There is no question that the governing factor in obtaining this result is not to be found in any new legislative measure, but in improved local administration. In the last resort, this improved local administration must rest on local opinion; and it is upon the education of local opinion that progress must chiefly depend.

The Minister recognizes that the present Bill is not a drastic measure. During the present industrial depression, it is important not to do anything which might even seem to hinder the recovery of trade. Even as it is, he is receiving representations from manufacturers protesting against the Bill. He is himself satisfied that the Bill, if passed as it now stands, can be administered without any harm to industry; and he is anxious to obtain the passage of a measure which can be worked, rather than one which, however excellent might be its provisions on paper, would in fact not be administered by local authorities because there was not sufficient backing behind it.

A similar letter has been addressed to the Hon. Secretary of the National Association for the Prevention of Infant Mortality.—Yours faithfully,

(Signed) DOUGLAS VEALE,
Private Secretary.

Dr. Saleeby (for the Sunlight League) to the Minister of Health.

The Sunlight League,
Carnegie House,
117, *Piccadilly,*
London, W. 1.
August, 1926.

DEAR MR. CHAMBERLAIN,—I have now had an opportunity of considering in detail your Private Secretary's letter of July 22 conveying your reply to the memorandum on the Smoke Abatement Bill which I submitted with my letter of July 1.

On behalf of the Sunlight League, I should like to thank you for your communication, which in the main is very reassuring, particularly in regard to the provisions affecting industrial smoke and your intention to exercise your powers under Clause 2 (1).

Your interesting reply, however, to our criticisms of Clause 5 does, I think, fail to appreciate some of the arguments put forward in the memorandum which I sent you. I accordingly enclose on behalf of the Sunlight League a further short memorandum drawn up in the light of your letter of July 22, dealing with the suggestion that new dwelling-houses, and cooking, should come within the scope of Clause 5. I hope you will give these further observations your attention.—Yours faithfully,

(Signed) C. W. SALEEBY.

PUBLIC HEALTH (SMOKE ABATEMENT) BILL, CLAUSE 5.

Memorandum to the Minister of Health (with reference to our suggestion that the words "other than private dwelling houses" should be deleted from the Clause, and the words "or cooking" added after the word "heating").—August, 1926.

We fully agree that, as stated in the Minister's letter of July 22, the "problem of domestic smoke cannot be solved until means have been devised for reducing the smoke from existing grates." But the effect of deleting the words, now standing in the Clause, "other than private dwelling houses" would not in our opinion be open to objection on the grounds that it differentiated between persons living in existing houses and persons in new houses. If the principle were accepted that a reform cannot be proceeded with unless it can be universally applied at one step, progress would quickly cease. As a matter of fact, it is clear that no such principle is being accepted, in view of the distinction already permitted between houses provided by local authorities and houses built by private enterprise. A local authority can determine, subject to the approval of the Minister, to equip the former with gas or electricity, or both, but has no powers whatever to make regulations to reduce the emission of smoke in the latter.

The question, therefore, arises whether, in fact, if the powers which we suggest were given to local authorities, this would in any way administer a set-back to the progress now being made in providing houses built by private enterprise. We submit that the fact that the majority of houses provided by local authorities are equipped with gas or electricity is itself proof of the general acceptability of such arrangements. We certainly agree that, as stated in your letter, "there are limits to the extent to which it is possible to induce householders to adopt methods of heating to which they are not used." But there would under our proposals be no greater danger of these limits being exceeded in the case of "private enterprise houses" than there is at present in the case of a local authority's houses. Indeed, in making and approving by-laws relating to new dwelling houses in general, local authorities and the Minister would have the advantage of experience already gained under housing schemes to guide them as to the limits of practicability.

Further, it is pointed out in your letter that "at the present time smokeless methods of heating . . . are usually more costly than the use of coal," and that this may be a matter of importance to the less well-to-do. All this is obviously true. But we would point out that the very houses (built by local authorities) in which gas or electricity has already been provided, and has been proved (within limits) to be acceptable to the householders, are houses in the main designed for and occupied by persons of limited means. We therefore submit that, while there are admitted limits to the practicability of dealing with new dwelling houses—limits which vary from district to district—there is ample evidence that in many places by-laws could be made without damage to private building, or financial hardship to the householders. The flexibility of a purely permissive clause is required, and we suggest nothing more; but we submit that under the Clause, amended as we suggest, some very useful progress could be made.

With regard to cooking, we desire to point out that the coal-fired kitchener is not only one of the worst but one of the least necessary causes of smoke emission. We are informed that over five million gas cookers alone are in use in this country, and though there are certain places in which the price of gas is prohibitive or gas is not even available, the cooking problem presents far fewer difficulties than the heating problem. We therefore submit that even if the words "other than private dwelling houses" were to be retained, the words "or cooking" should still be added in the Clause. Otherwise, in our view, the Bill, in making no attack upon the coal-fired kitchener, misses its most obvious victim.

Finally, we attach importance to our proposals for a further reason to which we ask your special attention. If the Clause be passed as it stands at present, it is calculated to give the impression that not even a partial solution of the problem of domestic smoke is at hand. We believe that the effect of creating this impression will be definitely to retard the spontaneous adoption of smokeless methods of heating and cooking, especially in existing houses. If, on the other hand, the Government were to show their belief even in the limited efficacy and practicability of existing smokeless methods, public interest would be aroused and a considerable stimulus given to householders in general to investigate the available methods with a view to adopting them in their own homes. For the Government to suggest, as the present Clause may do, that domestic smoke cannot be successfully abated, is to discourage individual effort and perpetuate the evil even where it could be removed.

Drip Pumping at Reading (Pa.).

"Pumping Drips, 1926 Fashion," is the title of an article appearing in the "American Gas Association Monthly," in which Mr. William Naile, Superintendent of Distribution, describes the method that has been used during the past two years by the Reading (Pa.) Consumers' Gas Company for pumping drips. The outfit comprises in the first place a 500-gallon welded steel tank, mounted on a 2-ton chassis. To measure the amount of liquid pumped from each drip, there is a float device which indicates directly in gallons on a scale. A vacuum gauge is mounted on the right side of the truck; and this enables the operator to determine when all the liquid has been drawn from the drip. Air release and liquid check valves are provided to get rid of the air in the tank while it is being filled, and to prevent spilling of the liquid during transit. A 5 in. by 5 in. piston pump, with a rated capacity of about 33 gallons of liquid per minute, is mounted between the tank and the cab. The pump receives power from the truck motor through a separate shaft on the transmission. The power take-off control and auxiliary gas throttle are mounted directly below the pump on the right side of the unit. The pump is protected by a substantial curtain cover, which can readily be thrown back, when it is desired to get to the pump. Necessary valves on the inlet and outlet of the pump are within easy reach on the right side of the tank. The unit has two flexible hose drip connections, one of which is run to the front, and the other to the rear. This arrangement permits of pumping drips from almost any position to the front or rear of the truck or to either side. A flexible hose is also used to connect the pump to the tank, so that leaks at joints of pipes and fittings are eliminated. To prevent freezing of the liquid in the pump and connections, a heating unit is placed so as to keep the pump warm during cold weather. A heater pipe is also carried to the rear outlet of the tank. The heater units are connected to the exhaust pipe from the engine of the truck.

National Coal Products Exhibition.—In connection with the above Exhibition, which has been organized by the Manchester Section of the Society of Chemical Industry, a comprehensive exhibit of models, drawings, and photographs, illustrative of plant and processes in the coal and allied industries, is being arranged. Those participating are required to deliver models at the City Hall, Manchester, before Friday next.

COMMERCIAL VALUE OF A CENSUS OF CONSUMERS' PREMISES AND THE INSPECTION AND MAINTENANCE OF APPLIANCES.

[Extracts from a paper by H. H. Creasey (Manager, Special Service Section, Gas Sales Department, Gas Light and Coke Company), before the "B.C.G.A.," at Newcastle, on Oct. 27.]

DIAGNOSIS BEFORE TREATMENT.

In the title of the paper the words "census of consumers' premises" come before "maintenance." This indicates the view taken and the policy adopted by my Company; because, while we have for many years been carrying out a scheme of partly charged and partly free maintenance (to which I refer later), we are confident that, if we are to achieve the ideal at which we are all aiming—namely, perfect service to our consumers—we must from time to time make an examination of the whole of their installations and take a census of the whole of their premises. We are convinced that upon such a system, with which, as a necessary corollary, must be included the periodical maintenance of appliances, the present and future prosperity of our industry largely depends.

POLICY OF COMPLETE CENSUS.

There seem to me to be varying views on the subject of what constitutes the inspection and maintenance of consumers' appliances, and how they should be carried out. As far as I can gather, there are undertakings which include both examination and maintenance in one operation by the same man. Having regard to the conditions which exist in our area of supply, we consider that there is an essential difference between inspection and maintenance; and that whether the maintenance of a consumer's appliances is already being carried out, or not, a complete "census," or examination of the consumer's premises and appliances, is necessary, and should be made from time to time by someone other than a maintenance fitter.

PATCHING-UP OBSOLETE GOODS.

A workman may go on maintaining an appliance which is no credit to the undertaking or to the industry, while in the best interests of all concerned (especially that of the consumer) it should be exchanged for a more up-to-date and efficient one. Again, it may be that a gas fire, though functioning efficiently, is unsuitable from the viewpoints of either adequacy or appearance—it may be out of harmony with its surroundings, or be fitted in an ugly though effective fashion—and a workman is not the right representative of the undertaking to deal with such circumstances. It must be remembered that a call by an official for some other purpose at some other time may not lead to the detection of the undesirable appliance. Only some such scheme as that outlined in this paper can, I submit, possibly cover completely all the vital points.

A maintenance man to us is a workman or fitter—a craftsman—who, while he is capable of giving a certain amount of advice and assistance to a consumer, is unlikely to have the judgment, or the experience and efficiency, of the type of man we employ to carry out the careful and skilled examination of consumers' premises and appliances, and the recording alike of them and of the potential opportunities for further business which are carried out under what we call our Examination Scheme.

EDUCATED ADVISORS NECESSARY.

The type of craftsman capable of maintaining apparatus can probably be obtained in the ratio of 20 to 1 compared with the men required for examination or census work; and a fitter who is capable of carrying out maintenance work is by no means the one who can efficiently act as the consumer's guide, philosopher, and friend, and thereby as a profitable salesman—an important point. If a man employed as a maintenance fitter were capable of these things, his quality would be wasted, and he should be promoted, and cease to function as a craftsman. In short, we consider that the work of an examiner is too complex and too important, because of its possibilities if thoroughly done, for a fitter to be used for the purpose. I will now give some details of our scheme regarding ordinary consumers.

Our examiner's call is preceded by a letter, which contains his name and heralds his approach. The letter is signed by the Controller of Gas Sales.

EXAMINER *versus* FITTER.

The consumer expects to see someone of rather more importance than a workman, and is entitled to anticipate a visit from one who is reasonably expert on any gas subject upon which he may desire advice or assistance.

I have heard of cases where letters have been sent to consumers asking them whether they are satisfied with their apparatus, and stating that a representative will call to ascertain whether this is the case. When the representative has called, if the consumer has said that he or she was perfectly satisfied, the representative has got a signature to a card to this effect, and the "examination" has ended there; no apparatus or fittings being actually inspected.

Such a system does not go far enough. It is really worse than nothing in many cases, because it creates a false sense of security, an idea that all has been done that is necessary. While it is, of course, important to know that a consumer is satisfied, this is by no means all that is to be desired. The consumer may be, often is, satisfied with something far short of our best, and ought not to be satisfied. What we want to know on the certificate of one of our expert representatives is whether we, with our better knowledge of the possibilities of gas, can feel satisfied; and this certificate can only be based upon a careful examination by him of the whole of a consumer's installation.

DUTIES OF EXAMINERS.

The duties of our examiners, the details of the office routine and recording work involved, and a great deal of advice and instruction to the examiners regarding the objects and working of this scheme, have been carefully laid down in our book of "Instructions to Examiners." I have Mr. Goodenough's authority to say that the Company will be glad to furnish a copy of the full book of instructions to any member wishing to go into the scheme more closely.

While the organization is centralized at our chief office—as regards the issuing of "obtaining entrance" letters, the keeping of master record cards, and the subsequent issuing of canvassing letters—examiners always operate from, and use, the offices to which the districts they work on are attached.

They are thus constantly in touch with the district inspectors, from whom they can get advice in any difficult case. We have also a liaison officer between the inspector, the examiner, and the central organization, who is in charge of a number of examiners operating from several offices. This officer is known as an inspecting examiner.

The examiner's duty is to inspect the whole of each consumer's installation, from beginning to end, to see that it is in a satisfactory condition, and to deal with any complaints which are made by the consumer.

He must light up and test all appliances; see that each is completely suitable for the purpose for which it is installed; recommend any repairs or alterations that are necessary to consumers' appliances; and arrange for any necessary to those which are hired from the Company, whether they are being periodically maintained under agreement or not.

He is also required to note and make a record of certain details regarding the consumer's premises and appliances, which we speak of as "taking a census." These details become the basis for future canvassing campaigns. The opportunities which exist for additional business are thus established, and serve as targets.

RECORDS LEAD TO ORDERS.

In our experience, a positive record of the details of a consumer's premises and installation is invaluable; and though many items which are entered on our cards by the examiner may already be known, and, indeed, appear in what we call our meter index books, no such complete record as we are now compiling ever existed until we started the examination scheme.

Having done all that is required in this direction, the examiner last, but by no means least, must try diplomatically for orders, because if such services as I have set out are to be rendered to a consumer entirely free of charge, it is desirable that additional business should result in a fair proportion of cases. It is obvious that the price of gas would have to bear the addition to our costs which is incurred, unless something more than better service to the consumer, with consolidation of his existing custom, were gained thereby.

Hence the "commercial" part of my title. We have proved that this service pays in new business, as well as in conserved business.

It is important here to mention that the fundamentals of our scheme are based on the fact that we, as an undertaking, ourselves carry out any installation work for which we may obtain orders from our consumers, who now employ us to carry out a large proportion of their work, and do not now employ private gasfitters to any appreciable extent.

A great deal of their work in the past, however, was carried out by outside firms and by private gasfitters in a small way of business; and it is from the results of a great deal of their work that we find our consumers have suffered—and are still suffering—most.

We realize that our present system in its entirety is not practicable in the areas of some gas undertakings, for reasons arising out of local conditions. If I may say so, we sympathize cordially with those who do not carry out the whole system merely because they cannot, however much they may wish to do so.

In accordance with our standard practice, an examiner must

be prepared to accept—or to persuade a consumer to give—an order and to deal with the whole matter throughout.

DELAYS ARE DANGEROUS.

When the examiner has succeeded in bringing a consumer to the point of desire regarding the suggested installation of any appliance, we do not consider that the consumer should be told "I will send someone along to arrange what is necessary." The examiner is the someone to do that. He is the Company to the consumer, and has been referred to in our letter as a skilled representative. Unless, therefore, a job is one of such magnitude as to require further investigation, measurements, and calculations, he should be capable of clinching the order there and then, and of passing it straight to those who are to carry it out. Nothing is more annoying to a consumer than to have more than one person to deal with in such a matter.

TECHNICALLY QUALIFIED SALESMEN IMPERATIVE.

The need of a technically qualified salesman, instead of a fitter, for examination work is clearly indicated, even as regards an ordinary consumer's dwelling house. I think it will be generally accepted that this need is accentuated in the case of a factory, or the premises of such important consumers as doctors, architects, and other professional men who are called upon to give advice to the public.

FACTORY EXAMINATION AND MANUFACTURING EFFICIENCY.

Just before the war we commenced an examination of factories. One representative specially qualified for the work began to call upon factory consumers, to examine all their apparatus, with a view to giving advice and assistance thereon. We have now examined all the appliances—and recorded these and the open opportunities which exist—in nearly 8000 factories. The additional business that has arisen out of the inspection, overhaul, repair, and reconstruction of consumers' out-of-date plant, has been so enormous that we have repeatedly found it necessary to appoint extra representatives to handle the work. Indeed, the demand for additional industrial representatives arises at a more rapid rate than we are able to train them.

Our experience has proved that there is some result to be achieved from the examination of almost every factory to which our representatives gain access; and the immediate and subsequent work arising out of this naturally slows down their rate of examination of other factories. They are always discovering opportunities for carrying out experiments, and frequently find a great deal of the consumer's plant in such an inefficient condition that it is on the verge of being scrapped in favour of one or other of our competitors.

There is perhaps no harm in setting out short details of the results achieved during the past year in connection with this factory examination scheme.

Orders were obtained for the installation of 421 cookers, 122 water heaters, 2175 heaters, 2019 trade appliances, 69 gas engines, and 3196 lights and small appliances.

The total amount of money taken for the sale of appliances, the reconstruction of factory consumers' own apparatus, and for fixing work was £26,214; while for adjustments and overhauling work a further sum of £1183 was charged.

GAS ENGINES.

We have been once round all the gas engines in our area, and are well forward with a second examination. When I tell you that we have more than 2200 engines, with a total of over 40,000 B.H.P. and an annual consumption of over 2½ million therms, you will appreciate that the load is worthy of our care and attention.

We get orders for new engines in place of those which are too bad to repair; and in cases where the consumer needs more power, and would have scrapped his existing engine and installed electric motors, we frequently get the order for a new and larger engine, or engines, to provide the extra power required. Last year we installed as many engines as we did in the previous two years put together, and the B.H.P. installed was four times greater than in the previous year—and this at a time when trade was very bad and electric competition was keener than ever.

SERVICE TO DOMESTIC CONSUMERS.

Having already decided upon a system, we first had an opportunity of trying it out on one district in 1921, and the Directors subsequently extended the scheme to a number of other districts, and have now authorized its extension to all. It was decided to use what we call an Assisting Inspector for the purpose—that is, a man in training for promotion to the district staff. A man who has reached this position has been through all the various phases of gas sales work, and has had such practical and clerical experience as to qualify him to take up the work of assisting an inspector who has charge of a district. He thus knows the whole district routine from A to Z; has already handled customers and all their inquiries; and especially has had experience in taking orders for appliances and setting up specifications and estimates for their fixing. He is on a grade which is just below that of a staff assistant inspector, which position he is desirous of gaining, and he therefore has an additional incentive to attain the utmost degree of success in his new task.

TRAINING OFFICERS AND MEN.

We have set up what we call a "valuation by points" system, by which the results obtained by each man are valued, and upon which are based promotions to staff appointments, and subsequently the annual bonuses paid to those who become staff officers and remain on the work. We have also found that the examination work is a good training ground for the production of men needed in the section for higher-grade special work; and from time to time we have been able to draft examiners to more important positions.

The whole pointing system is based on the ideal of the maximum service to the consumer, and is so balanced that it does not pay an examiner to do anything other than the right thing from the consumer's point of view. It is impressed upon the examiner that no effort is to be made to obtain an order for something that would not serve the best interests of the consumer, or would be beyond his means to pay for in running cost. The examiner is also made to understand that he is trusted, that he is not bound down to examine so many premises per day, but that the number depends upon his own judgment as to how long he can profitably spend on any one consumer's premises.

It must be remembered that, before an examiner is chosen, he has already proved his worth, so there is little risk in leaving him to decide how many examinations he makes per day. At the worst, we have no difficulty in ascertaining from his results whether or not an examiner is reasonably pulling his weight.

The pointing system has also been applied with great success to the activities of the representatives who deal with the special classes—doctors, &c.—previously referred to, and to those who deal with factories; and we find that the general result of the system is an uplift of the whole body of men concerned. Better results accordingly accrue, and the keenest enthusiasm is shown, coupled with a determined effort to beat the next man

RESULTS.

Eight new examiners, each commencing work on a district where the scheme had not previously been carried out, examined 1375 premises in the first six weeks, or 28·6 per man-week, and the same eight men nine months later, still progressing on the same districts, examined 560 in two weeks, or 35 per man-week. During the two periods mentioned the highest number of examinations in one week by any man was 50.

During the twelve months ended Sept. 30 the total number of ordinary consumers' premises examined was 43,463. The total of man-weeks was 1523, which brings us to an average throughout the year of 28·5 premises examined per man-week.

The total cost of the examination of these 43,463 premises was £7367, or about 3s. 4d. per consumer. Apart from the value of the scheme as a factor in gaining and maintaining the goodwill of our consumers, the tangible results obtained, when valued on what we consider is a conservative basis, more than cover the whole cost of running the scheme.

The 1523 man-weeks produced the following results. Orders were obtained for the installation of 566 cookers, 167 water heaters, 2250 heaters, 1279 lights, and 303 small trade and other appliances. The amount of money taken for sales of appliances was £7230, and for fixing work £6043. Many appliances, both hired from the Company and owned by consumers, were overhauled, and orders for periodical maintenance were obtained.

In addition to all the orders for extra appliances and the money obtained for their purchase and fixing, and for repairs to consumers' own apparatus, many thousands of non-chargeable jobs were booked for attention—such as escapes, shortage of supply, and defects in hired apparatus for which no charge would be made. Though this work had to be carried out at our expense, it was unquestionably of value from the viewpoints both of the safety and of the satisfaction of our consumers.

Agreements were taken from consumers for the periodical maintenance, at our usual charges, of the following appliances: 905 cookers, 31 water heaters, 2026 heaters, 488 lighting burners, and the charges made to consumers for adjustments to their own apparatus, sometimes prior to maintenance being undertaken, were £1020, which, added to the amount taken for sales and fixing, makes a grand total of £14,293, or an average of about £9 8s. per man-week.

The estimated annual consumption of the additional appliances installed was over a quarter of a million therms.

TRAINING SUITABLE STAFF.

[Having given some truly remarkable results relating to hotels, hotel kitchens, hospitals, &c., Mr. Creasey went on to deal with the above subject.] As the examiners are taken from the district inspectors' staff, we have also to be extremely careful that we do not unduly—and indeed unwisely—deplete the latter. The industry's education scheme, now happily in full swing, will, no doubt, materially assist us in increasing the number of men who will ultimately become suitable for the work, but at the moment we have only 36 examiners working, while we need 117 if all districts (including those on the late Brentford Company's area) are to be simultaneously in course

of examination. We have completed the examination in 29 districts; are now working on 36 others; and 52 remain to be commenced at a later date. The total number of installations examined since we began the work is about 135,000, and we are proceeding at the rate of about 1000 per week. We have not as yet repeated the examination on any district, as at present we are endeavouring to get once round the whole of our area before we do any district twice.

OBJECTIONS TO COMPULSORY EXAMINATION.

The difficulty we have met with in speedily finding enough of the right kind of men—a situation which, no doubt, exists throughout the country—conclusively proves that it would be useless for the authorities to attempt to place a legal obligation upon the gas industry to carry out forthwith any comprehensive and drastic scheme of examination of all consumers' appliances.

While suitable men are not available in sufficient numbers at the moment, the industry has initiated a comprehensive training scheme; and this, coupled with our own efforts, will enable us to reach our goal in due course. Meanwhile, we are carrying on as fast as we can, and in addition to the examination scheme our consumers whose appliances have not been thus examined are receiving a great deal of attention in the way of free periodical maintenance of certain appliances, and can arrange for their own appliances to be maintained at a small charge.

PREPAYMENT SUPPLIES.

It is obvious that the average installation to be found on the premises of a prepayment meter consumer is less comprehensive than that of an ordinary consumer. Practically all such installations have also been put in by ourselves, and have since been under our care; and because the whole thing is looked upon as our responsibility, the consumers more readily come to us with their troubles.

Moreover, collectors usually call more frequently than is the case with our ordinary consumers; and as they have to remove coins from the meters inside the consumers' premises, they are in more direct touch. A prepayment meter collector, therefore, deals with—or books for attention—a number of complaints or defects to which his attention is drawn when he calls from time to time to collect the money from the meters. Having all these things in consideration, therefore, we feel that, while an occasional complete examination of all prepayment supplies is valuable—and indeed both necessary and profitable—the matter is not so urgent as the examination of the installations of ordinary consumers.

We have, however, carried out complete examinations of all our automatic supplies at fairly frequent intervals. One such was made before 1911, and one between 1911 and 1913. During the war, and for some time afterwards, it was, of course, impossible to do anything in this direction; but we started again in 1922, and in due course again completed the round.

A DIFFERENT TYPE OF EXAMINER.

The kind of man we use for this work is a good type of fitter, who brings in a great deal of additional business as a result of his interviews with consumers—many of them of his own type—when carrying out the examinations. There are, of course, adjustments and repairs to appliances involved, which the examiners either carry out on the spot, if minor in character, or book for attention. Orders for new installations are frequently taken in cases, for instance, where a house has been split up into tenements and the service riser supplies prepayment meters on (say) three out of four floors, on one of which the tenant does not use gas.

In the course of our last complete examination of over a half-a-million prepayment supplies, orders were taken for thousands of cookers where none was in use, thousands of gas fires, and tens of thousands of additional lighting points.

ANNUAL CHARGE FOR LIGHTING MAINTENANCE.

The Company have for very many years carried out, at a charge, the work of maintaining consumers' lighting installations wherever they have agreed to take advantage of this service on the terms offered.

We now have two systems of incandescent burner maintenance, both in use by other undertakings. In one of these the consumer enters into a definite contract covering weekly or fortnightly inspections of incandescent burners (as required) at so much per burner, which sum covers the cost of cleaning and replacing mantles, as and when required—and at a small extra charge glassware is also cleaned and insured.

Under the other system a man is sent periodically to inspect the burners in the house of any consumer who agrees to take advantage of this service at a charge of 2d. per burner per inspection, *plus* the cost of any mantles or glassware required. Under this latter system, only the burners which the consumer wishes inspected at any visit are attended to and charged for, whereas under the first system the whole of the burners of the house are covered by one contract, and are charged for at so much per inspection, no matter whether they all need and receive attention or not.

TWO SYSTEMS OF MAINTENANCE.

We undertake the maintenance of appliances; some of the work being carried out on a "charge" and some on a "no charge" basis. Under the heading of "chargeable," I will mention that for many years we have had fixed rates for the periodical inspection of gas fires, cookers, and water heaters, whether privately owned or hired from the Company. The time elapsing between the inspections has varied according to the circumstances or to the consumers' requirements.

For gas fires and single-oven cookers the pre-war rate was 1s. per inspection, and for circulating water heaters 20s. per inspection. These charges covered all normal types of these appliances; special rates being quoted for any of unusual character or magnitude, such as a large roasting oven or a treble-oven gas cooker. If the appliances have been hired from the Company, the charges have covered a periodical inspection—*i.e.*, our workmen have called at stated intervals whether the consumer has complained or not, and have cleaned and overhauled the apparatus, carrying out any necessary repairs and replacement of parts which were required to put the apparatus into thorough working order.

CUSTOMERS' OWN APPLIANCES.

If the appliance is privately owned, the same attention is given in every respect, except as regards repairs or replacements of parts, which are charged for at cost price, in addition to the standard inspection charges, after an estimate has been accepted by the consumer.

Since the war our rates for this service have been increased by 50 p.ct. Whenever five or more appliances are inspected at one address, at the same time, we make the following reduction: 2d. per appliance on from 5 to 10 appliances, and 3d. per appliance on 11 and over.

As regards hired geysers, these have always been rented at a figure calculated to cover the whole cost of periodical inspections and upkeep. Three inspections per annum are given to each geyser, when it is thoroughly overhauled, and any repairs are carried out at no further charge to the consumer.

We also undertake the periodical inspection of privately-owned geysers, in which case we make four inspections per annum at a quarterly charge, which varies according to the size and type of the machine. The lowest charge is 1s. 9d. per quarter for the size suitable for a lavatory basin, and the highest 14s. per quarter for a large Califont. These charges include inspection and all repairs and renewals of parts, flue-pipes, and bafflers, and the same system as that for hired geysers, for a period not exceeding ten years from the date the machine was purchased.

NON-CHARGEABLE MAINTENANCE.

For a number of years we have carried out a certain amount of free periodical maintenance of our consumers' apparatus. The first free work of this kind of any magnitude was started by us in 1907.

We also maintain, with free periodical inspections, all hired hot water apparatus (other than geysers, already specifically dealt with) and for some time past have given the same gratis attention to hired gas-steam radiators. During the past two or three years we have further extended our free maintenance system to gas fires and radiators (either hired or privately owned) which are "in the eye of the public."

A RECENT DEPARTURE.

In view of the experience gained in carrying out our examination, and our existing maintenance schemes, the Directors, rather more than a year ago, resolved to extend free periodical maintenance inspections to all hired gas fires. This scheme has been working satisfactorily during the whole of the past summer, in which period every hired fire to which access could be obtained (except about 40,000 installed on prepayment supplies) has been inspected and overhauled.

A number of men were selected for the purpose, were specially trained, and those who passed a comprehensive test were started on the work. We commenced on April 5, and at first employed 118 men. They overhauled a total of 6150 fires during the first seven days, or an average of 7·44 fires per man-day. During the next fortnight, we were able to add five more trained men, a total of 123. A total of 10,521 fires were then overhauled in 11 days, or an average per man-day of 7·78, the rate of inspection having appreciably increased per man. The maximum number of fires attended to in any fortnight was 13,219, and the highest average per man-day over a short period was 10·34.

SOME ASTOUNDING FIGURES.

The total number of hired fires overhauled from April to the end of September (when the men were again needed to return to incandescent burner maintenance work) was about 150,000, of which about 20,000 were fixed on prepayment supplies.

The highest average rate per man-day, which I have quoted—viz., 10·34, or, roughly, 10 per man-day—is the rate which we expect to maintain in future years. The work has been carefully costed, and it has been found that the average cost of inspection for each fire is about 1s. 5d.

We have also ascertained that the average cost of dealing with a complaint received from a consumer, regarding a defective hired fire is 2s. 10d. We have, therefore, learned that it will cost the Company no more to carry out periodical in-

spections of hired gas fires than it does to wait for and deal with complaints from consumers regarding them, so long as our system of periodical inspection reduces the complaints which we receive by one per fire every two years.

Experience alone can tell us to what extent our complaints will be reduced. We have already noticed a falling-off in this direction; and if they are reduced to the extent I have indicated, we shall be rendering better service to our consumers at no increased cost to the Company, while it is even possible that the new system will cost less than the old method of waiting for complaints.

GLASGOW SCHEME OF MAINTENANCE.

By J. W. McLUSKY.

It would be difficult for anyone holding a brief for the gas industry to quarrel with Mr. Creasey's arguments in favour of the inspection and maintenance of consumers' appliances. He has shown us that they in London are laying a foundation broad and deep, upon which they will undoubtedly erect an enormous edifice of goodwill among their consumers. It is in the "angle of approach," as Mr. Creasey terms it, that various undertakings may differ in their common endeavour to attain equally good results. For example, I am satisfied that the ambitious policy of the Gas Light and Coke Company and the Glasgow Corporation Gas Committee regarding the condition of consumers' appliances is equally necessary and important; yet I am convinced that the method adopted and described by Mr. Creasey's Company would be applicable only to the suburban community of the Glasgow area, and this proportion would probably not extend to more than 35 p.ct. of the total gas area. I say this realizing that Mr. Creasey's total area is extensive enough to embrace several schemes of a different type simultaneously.

After a series of experiments in various areas, we have arrived at the conclusion in Glasgow that the maintenance fitter under the supervision of the maintenance inspector can tackle the whole job, which includes the examination of meter and connections, the overhaul of all burners and appliances, and testing for pressure and escapes, for 3s. 11d. per house. In seven years in Glasgow we have renewed half of the service piping; and probably in the space of fourteen years the whole city will be reserviced.

Here let me register my appreciation of Mr. Creasey's desire for only the best type of fitter; for I am convinced that no factor can be so militant against the success of any scheme of maintenance as the fitter who is not possessed of the dual gift of good craftsmanship coupled with tidy habits and tactful manners in his dealings with consumers. A man has said to me: "Do not give me any of your tobacco chewing plumbers for maintenance;" and that is what I mean. You want a particular kind of man for this particular kind of job—a nice tidy sort of man, who gets on with the ladies and leaves a good impression of gas behind him. [Laughter.] This problem of the suitable man has always given the responsible official grave concern, and will continue to do so until the authorities grant permission to inaugurate training schemes for apprentices. The Brighton Gas Company have launched an admirable scheme of universal service, where youths of (say) 16 commence training at a wage of 4½d. per hour, and rise in five years to 10d. an hour. These men, while receiving training, are carrying out most useful work at a moderate expenditure, and are gradually moulded to the Gas Company's pattern of good public service. I say "moulded" advisedly, because I always think that if you get hold of a young man you can certainly mould him. This scheme should in future provide the means whereby the Company's reputation for efficient service will be more than ever firmly established.

Now, when one compares this method with that of Glasgow, where the maintenance fitter is paid 1s. 4·36d. per hour, the increased cost in Glasgow is at once apparent. Moreover, the men in Glasgow have been recruited from various shops where their minds have not always been directed towards giving the public an expeditious, clean, and tidy piece of work. When I come to that, I think of a doctor whom I want to have gas fires; and he will not have them, because he says "The idea of having plumbers in this house is something I cannot tolerate." The only means I can think of is to get the doctor away on a sea voyage, and then instal the fires during his absence. [Laughter.] At the same time, we can justly claim to have achieved great things at a remarkably low cost; and the improved results in the poorer localities have been greatly appreciated. Referring to poorer localities reminds me that during the past quarter the revenue from slot meters showed an £11,000 increase as compared with last year. This is in the localities where there is great depression, and yet the people have put £11,000 more in the slot meters than during the corresponding quarter of last year. If they never realized it before, the public have had it brought right home to them recently that gas is a universal and an indispensable servant.

Our scheme has provided us in its initial stages with a complete census of burners and appliances in the entire area of supply. This is recorded on cards, grouped into the municipal wards, and again sub-divided into maintenance sections. By reference to this information, the sales section can concentrate on any part of the city for any type of appliance which it is considered advisable to push at any particular time. The possession of details of all appliances in all premises is a valuable and permanent guide to the sales section and costing staff. The average consumption of gas per quarter is also carefully studied, to ascertain if the capital outlay on certain areas is justified by the financial return. Such information enables the management to assess the value of one area as compared with another, and to put the correct value upon any special piece of propaganda.

I note with pleasure that Mr. Creasey objects to the term "free maintenance." That is an expression which has never been used in Glasgow. Every consumer in the area knows that the cost of this special service is 1½d. per 1000 c.ft. bought, and that it is therefore not "free." Glasgow resembles other cities, inasmuch as "one gets nothing for nothing, and very little for sixpence." [Laughter.] We know that gas consumers do not appreciate the value of anything that is free, and we take due advantage of the knowledge. With reference to the amount of work carried out per man-day, the result depends entirely upon the locality and type of property; but the average of last month in widely varying districts may be interesting.

From returns, I find that the number of houses completed per man-day averages eight—I am speaking now of September—and taking the city average of five burners and appliances per house, this brings the total out at 44 houses per man-week, or 220 burners and appliances, *plus* examination of meter and connections per man-week. I do not know what you call that, but I call it good work. We do not expect the maintenance fitter to give expert advice regarding the merits of one type of appliance as compared with another, although they have brought in orders for thousands of more modern appliances than those in use. A maintenance fitter may write comments or opinions on his report card to be attended to by his district inspector, who has more time to devote to the extra requirements of consumers. Our experience indicates that the great majority of appliances only require adjusting and cleaning; and this is where the maintenance fitter makes progress at the minimum of cost. Special complaints, requisitions, or alterations automatically pass into the hands of the more experienced man—the district inspector. That the district inspectors have more time is an important aspect of this maintenance scheme that I want to urge. They are relieved of this onerous duty of looking after ordinary complaints, and are free to seek "fresh pastures" for the consumption of gas. Two industries in which we have been pushing the use of gas are bread baking and the making of chocolate and confectionery. While ordinary trades may fail, bread and chocolate making are going on.

The chief end of any maintenance scheme should be, as Mr. Creasey suggests, the permanent satisfaction of the consumer. That is what we are out for. If we achieve this desirable result, we shall put across the most effective barrage known to combat the advance of electricity.

Discussion.

Mr. HAROLD E. COPP (Hull), proposing a vote of thanks to Mr. Creasey and Mr. McLusky, said he thought the paper of the former breathed the very spirit of the "B.C.G.A." The most important word in their vocabulary was "service;" and in order to render this service to their consumers, it was necessary that they should embark on some rather big scheme of education. In other words, the question of education was indissolubly bound up with that of service to the consumer. In some towns there was trouble in finding the right type of youth for education purposes; and this was largely due to the defects of their elementary system of education. Really, they had not only to find the youth with the right personality and the willingness to learn, but they had practically to start his education all over again. Mr. Goodenough had probably done more in this way than anyone else; and no doubt the Gas Light and Coke Company had reaped benefit from this source. In the Provinces, however, they were not so fortunately placed, and were faced with a rather uphill task from the very beginning. Reference had been made to the necessity of having people of the right type to gain access to consumers' premises; but there were quite a number of consumers who rather objected to people going into their houses on any pretext whatever, even to do them good. Therefore from any scheme like this one had to exclude certain consumers, and they had to be known, and some record kept of them; otherwise difficulties would arise. He would like to ask Mr. Creasey whether his examiners were in the uniform of the Company. This would make a difference. Another point was the maintenance of gas engines. Did Mr. Creasey indicate consumers' engines, and tell them, if they were not efficient, why they were not? He asked this because some years ago he inaugurated a scheme of indicating gas engines periodically, and found it led to a much increased power load, and was greatly appreciated by the manufacturers. He supposed that he had been asked to propose this vote of thanks because he had himself been responsible for a considerable amount of service to consumers in the way of maintenance. His Company had done a great deal for their consumers; but unfortunately he had not with him the figures of cost. He had, however, no doubt whatever that money spent in this way was money well spent, and that the service was much appreciated. To mention one item, he realized some time ago that the lighting load was rather slipping away, owing probably to lack of maintenance and periodical attention; and his Company had supplied a free maintenance burner to all prepayment consumers, numbering about 40,000. In other cases defective pendants had been replaced by fittings of a more modern pattern. Since these burners were installed, the demand for them

had been enormous; and they were still continuing to give great satisfaction.

CHEAP BURNERS AND FITTINGS.

Mr. G. H. TEALE (Yeadon) remarked that a Yorkshireman always wanted something cheap; and there were agents selling all kinds of cheap fittings and burners that were practically useless. What were they going to do with the mass of inferior articles that were put out in different parts of the country? They could not get the best out of them. This was a difficulty with which he would be glad to hear how it was proposed to deal.

Mr. W. M. CARR (Stretford), who seconded, remarked that he now served an undertaking which carried out what they called free maintenance, though he admitted that "free maintenance" was a misnomer, because it was a charge on the price of gas—and, he thought, a very unfair charge, for this reason: They had consumers using 100,000 c.ft. of gas and having five pieces of apparatus; and taking Mr. McLusky's figure of 1½d. per 1000 c.ft.—which was rather higher than he placed his own maintenance costs at—such consumers would pay 12s. 6d. for maintenance. The next-door neighbour might consume 20,000 c.ft. of gas and also have five pieces of apparatus; and he would pay 2s. 6d. He quoted this to show how inequitable it was to charge in the price of gas for maintenance. This was a difficulty which they had got to overcome. They must face it; and in any revision of the method of charging, it was urgent that they should endeavour to charge the whole of the consumers on the basis of their cost to the undertaking. A particular consumer should be charged only for the service that was rendered him. He hoped the day was not far distant when this would be general throughout the country, and that the National Gas Council might be able to evolve some acceptable scheme.

TO SHOW RESPECT IS TO GAIN RESPECT.

One very important point was the training of men to go to consumers as inspectors and examiners. This was a difficulty they were all feeling; and it was becoming increasingly great. His own personal experience was that there was not sufficient discipline taught in the schools to begin with. Nothing made more impression on a consumer than a polite and respectful official going into the house. He had during the past year started a class for the whole of his fitters, so that they might acquire a good bearing before the consumers; and he had had many letters from people expressing appreciation of the politeness and courtesy of the men who went to do work in their houses. He attached the greatest importance to this—especially in these days, when so many of their workpeople had been taught that to show respect was to demean themselves. They had, on the contrary, to do all they could to teach them that to show respect was to gain respect.

BAD SERVICE A BAD ADVERTISEMENT.

Sir ARTHUR DUCKHAM said that some people might be inclined to ask why one who had left the rosy paths of selling gas for the thorny paths of selling gas plant—[laughter]—should rise to speak on the subject of maintenance on the district. The reason was that he took a very keen interest in everything that concerned gas people—and a greater interest in the sales of gas than anything else, because he realized that unless gas was sold properly his other end of the business did not come in. He wished that the members of the Society of British Gas Industries (which was affiliated to that Association) would take a closer interest in following the work done by the "B.C.G.A.," and would feel that, even if they were making gasholders, pipes, &c., their interest in the Association was just as great as was that of those members who were making gas cookers and fires. He did not think sufficient support was given to the Association from the Society of British Gas Industries. Coming to the paper, this represented a magnificent amount of work and organization. The development that had been made had been wonderful. Speakers had, however, touched upon a difficult point, and that was the securing of suitable people to render the service, because bad service in the house was worse than anything. He believed that women could carry out this work in many cases far better than men; and that nowadays they could get an educated class of women for the purpose. He did not, of course, suggest that women should fix fires and cookers, and do work of that kind. He wished to be critical for a moment on this subject. It was essential that good service should be given, if the consumer was to burn gas. Bad service was a bad advertisement, not only to the people immediately concerned, but to visitors to houses where the bad service was given. He felt certain, therefore, that the work the Gas Light and Coke Company were doing was absolutely necessary. He quoted instances that he had come across, where the gas service was not such as could be commended. He had, he said, a house himself where there had never been any coal consumed. He designed it and built it himself. His gas cooker was a disgrace, and two or three of his gas fires were abominable. He pointed out these things, not because the gas industry was not doing wonderful work, but to show the great differences which existed in carrying out this essential duty. In each of the cases he had mentioned there might, he was certain, quite well be loss of business, which was the thing they wished to avoid. The class of person who went to a house to attend to these matters was of the utmost importance. Nothing made one more dissatisfied than bad service; but they had to find the right men for the job. Mr. Creasey's organization was good enough; but the difficulty was to secure really efficient men to carry out the work.

GOOD MANNERS COME FROM A GOOD DISPOSITION.

Mr. J. H. ELLIS (Plymouth) agreed with everything that had been said by Mr. Creasey and Mr. McLusky, but wished to emphasize the importance of the manners of the men who were sent round. It had been truly said that manners were all in all. His own men were specially chosen for their good manners; and good manners came from a good disposition. If they selected men for this qualification, they established between the consumer and the producer of gas that harmonious relationship which made for increase of business, to the advantage of both. There was one other point he wished to emphasize, with regard to the census of the district. By this they knew the gas consuming capacity of every house or factory in the area. They knew not only what they were doing themselves, but what other people were doing, or not doing. This enabled him to say that in his district, when he left, there were only five electric cookers in use, among a population of close upon 200,000. Many years ago when he was serving that part of the community which owned the electricity works, he induced the Chairman of the Electricity Committee to instal electricity throughout his house. He had to set a good example; but it proved so costly that he could not afford to continue this good example, and so he took it out. Quite recently another man, in a fit of pique, installed electricity throughout his house; but it was so costly that he had it taken out, and re-established gas. Not only so, but they got the lighting load as well; and he (the speaker) was one of those who was not going to give up his lighting load if he could help it. ["Hear, hear."]

Councillor F. BENDING (Mayor of Bexhill) said he wished to voice appreciation of the profit and enjoyment all had derived from that conference. It had been his privilege to attend many conferences of various kinds; but he had never been at one at which a higher note had been struck by all the speakers. He had, in fact, heard there the highest note, perhaps, that could be struck in any gathering of such a character—"Efficient service." Each speaker had realized to the full that "he profits most who serves best." It had been shown conclusively that efficient service did spell good returns, quite apart from any other aspect. He did want very sincerely to voice their appreciation, not only of the high standard which the papers had set and the large amount of useful information given, but also of the abundant hospitality bestowed upon them at Newcastle. This would be a memorable conference for all of them; and he and his Gas Engineer would be able to benefit the gas consumers of Bexhill because of their attendance there.

Mr. J. W. ELLIS (Deputy-Chairman of the Newcastle Gas Company) said he thought that gas directors, for instance, ought to set a good example by having gas fires in their houses. Again, people connected with gas companies could often influence to adopt gas those whom they knew socially. He had induced many people to instal gas fires and coke boilers, and so far had never come across anybody who had been dissatisfied. The "social side" had a very important bearing upon the use of gas.

REPLIES TO POINTS RAISED.

Mr. F. W. GOODENOUGH remarked that somebody had said to Mr. McLusky: "You rub in this question of maintenance very much." Well, the reply was: "Let everybody rub it in, until the whole industry is alive to the importance of maintenance. It is a subject we must not leave alone until we are satisfied that everything is being done that can be done." Anyone who considered himself progressive should see, at any rate once a year, that well-known play by Arnold Bennett, "Milestones." They needed always to be getting outside themselves and their systems, and looking at the latter with a critical eye, to make sure they were up-to-date. He would like to emphasize a point made by Mr. Creasey about not accepting merely the satisfaction of the consumer as their standard, but making quite sure that the consumer was getting all that he should be getting. ["Hear, hear."] When the Company started on the inspection of doctors' premises, they came across some of the most extraordinary things, and yet the doctors were perfectly satisfied. Probably they thought they were getting the best that gas could give. He would say, in answer to his friend from Yorkshire: "If you buy cheap rubbish in the way of gas appliances, you will get no satisfaction; and it is up to the gas undertakings to educate consumers to the fact that cheapness is not the most important consideration." His own Company had very little difficulty in gaining access to premises; the letter they sent out beforehand secured access for them in practically every case. They did indicate gas engines where necessary. It was a great mistake to put anything on the price of gas in respect of maintenance, if this could be avoided. Every customer should, if possible, pay for what he got himself; and if they put the whole of the charge for maintenance on gas, industrial consumers who maintained their own appliances would be paying for the maintenance work done for other people. The Company included in rentals an adequate sum to cover repairs and maintenance, as well as interest on capital. Good publicity and the popularizing of gas enabled one to obtain a price for service which would not otherwise be possible, and in this way the propaganda work more than paid for itself. In the year before the present department was formed for the sale of gas in his Company's district, they did work for their consumers to the total value of £18,000, and made a loss of £7000 in doing it. That was in the days when one had to give something away in order to get people to use gas. Last year the Company did work for their consumers to the total value of about £485,000, and made a profit of £21,000 in doing it. This result had been brought about very largely, he believed, by the popularizing of gas by means of publicity and good service, which enabled the Company to get paid for all the work they did at reasonable commercial rates. He did not think his Company's figures in regard to the number of premises inspected really differed materially from Mr. McLusky's. The number given by Mr. McLusky was 44 inspections per man-week, while Mr. Creasey's figure was about 28. The statistics Mr. Creasey was dealing with, however, referred only to ordinary consumers. If the prepayment consumers were added, the average would be about the same as Mr. McLusky's. As to what Sir Arthur Duckham had said, it was impossible to over-emphasize the importance of making sure that every gas fire which was used was a real advertisement for gas. He hoped Mr. Ronca would have realized from that conference that the gas industry was giving the very fullest consideration to this subject, and that he would go away with the confident feeling that the ques-

tion of the safe and efficient condition of gas appliances in this country was receiving the fullest attention from the gas industry.

Replying to the vote of thanks, which was carried with applause,

Mr. CREASEY said he would like briefly to refer to two of the points that had been raised. There were very few cases in which the consumer would not let the examiner enter, and those which did occur mostly arose out of nervousness. Such objection was usually made in the form of a letter to the Company, and as a rule the man got in, because he was on his way before the letter reached the Company. The men did not wear uniform; but the letter sent beforehand quoted the name of the caller, who also carried a visiting card. It was felt that a uniformed man was not the kind of man to do the work that these men did.

Mr. MCLUSKY remarked that he did not get one objection in a thousand cases. The men wore a uniform, and carried a card of introduction. The maintenance scheme cured complaints of "bad gas." It was perfectly evenly balanced, and the cost was negligible when compared with that of engaging a master plumber.

INSPECTION AND MAINTENANCE AT NEWCASTLE.

The President (Mr. John E. Cowen) had intended to give at the conference the following notes setting out the Newcastle views and experiences with regard to inspection and maintenance of appliances; but owing to lack of time it was impossible for him to do so.

The question of maintenance of gas-consuming appliances comes down to this. If we are to be progressive in our business, we must give satisfaction to our consumers. In order to give this satisfaction, we must see that the appliances of the consumer are kept in a satisfactory condition. Most of the large, and many of the small, undertakings recognize this, and are doing something towards attaining that end; and with them it is now more a matter of method than of principle. We are groping along trying various lines to find out which is the best method. Some are trying seasonal inspection and overhaul—*i.e.*, dealing with fires in the autumn, and cookers and water heaters in the spring and summer. Others are going from door to door, overhauling at one time the whole of the appliances in each consumer's house. The industry ought not to be forced at too great a pace. It is alive to the necessity of the matter from a business point of view, and we all want to find out what system will best suit our particular district. I would say, let all undertakings who have not yet taken up the matter decide to carry out experiments with various methods, and let the Association arrange for further exchange of experiences and opinions.

What has been done in Newcastle is as follows: A little before the war we inspected and overhauled without charge all the gas fires which were on hire at a cost of 1s. per fire. In 1924 we again inspected and overhauled, without charge, all fires, whether on hire or privately owned. The cost per fire was 11½d. for labour and 7¾d. for materials—a total of 1s. 7¼d. The average number dealt with per man per day was 10·56. Materials supplied included fuel for all makes of fires. Our experience after this inspection and overhauling was that the total number of complaints was not reduced. One reason was that previously all repair work on privately owned fires having been chargeable, consumers hesitated about making complaints, but once free repairs had been introduced they notified us immediately when any attention was necessary; and another reason was that all users of fires looked for a higher standard of efficiency than that with which they were previously content. This was all to the good.

In 1924, and again this year, we inspected and overhauled without charge all geysers and other water heaters. This year's cost was 2s. 8¼d. for labour and 5½d. for materials, a total of 3s. 1¾d.

During the last two years we have been inspecting and overhauling the whole of the prepayment meter installations, the cost of which was 1s. 7¾d. for labour and 1s. 6d. for materials, a total of 3s. 1½d., excluding the cost of new cookers and the fixing of new cookers in lieu of old—the fixing only may be taken as making an addition to the cost of 6d. per consumer.

At any time on request, we now repair free of charge all cookers and fires, whether hired or privately owned, and do repairs on internal work free if not involving a cost of more than (say) 5s. We have removed without charge all water-slide pendants in the district and in our acquired districts. We relay defective service pipes free, and clean and overhaul lighting burners and globes, charging for material only.

During the last two months we have been experimenting on the lines of universal maintenance. We have taken a district of 6000 consumers—mostly artisan property—and are calling at each house, whether fitted with ordinary or with prepayment installations. The proportion has been two ordinaries to one prepayment. The whole gas installation is overhauled, commencing with the testing of the meter. The cost has been 2s. 11d. per house for labour and 1s. 4d. for materials, a total of 4s. 3d. This cost has included the training of men; and the future average will be lower. The number of houses dealt with has been 3½ per man per day. The cost is high and number of jobs per day low, on account of it being the first round; but both will improve.

Inquiries for fires, cookers, and gas boilers have been received at 6 p.ct. of the houses visited, about half of which have resulted in definite orders to date. This percentage is improving. The cash received by the men for sales of burners, mantles, &c., represents about 1s. per house.

With regard to orders and generally dealing with this work, a great deal depends upon the workman. The supply of suitable labour, as has been pointed out by almost every speaker, is one of great difficulty, and will require careful consideration. If the cost in our case works out at (say) 3s. 9d. per house, it will represent an annual cost of about 1¾d. per 1000 c.ft. of gas sold. The experiment, however, is only half-way through. When completed, it will be for the Directors, after a full report from the officials, to consider it carefully, and decide upon the policy to be pursued.

MOTOR WINCH FOR GAS-WORKS.

The "Shipmate."

A compact and efficient motor winch manufactured by Messrs. Smart & Brown, of Erith, and known as the "Shipmate," is particularly suitable for gas-works purposes. The South Metropolitan Gas Company use one for discharging coke into steamers, and Messrs. Gibbons Bros., of Dudley, have five at work. One of these latter winches easily hoisted 34 tons of coal to a height of 94 ft. per 8-hour day; and the machine worked without the slightest hitch every day for three months, while coal-handling plant was being installed. Another company find that by employing a "Shipmate" they can discharge coal from lighters to vessels alongside at the average rate of 130 to 170 tons per 8-hour day.

THE WINCH DESCRIBED.

The whole apparatus is simple, is entirely self-contained, and occupies little space. It comprises one of Messrs. Smart & Brown's four-cycle single-cylinder engines, having a bore of 4 in. and a stroke of 6 in., developing 5 B.H.P. on paraffin at 750 R.P.M. The engine is fitted with a sensitive governor, forced lubrication, and H.T. magneto ignition, and is mounted on a strong cast-iron water tank bedplate; circulation being maintained by means of an eccentrically-driven plunger pump.

The drive is taken from the engine through a set of machine-cut spurs to a shaft mounting a clutch which is extremely smooth in operation, due to the fact that it is running in an oil bath. On this shaft are carried whipping drums, which are arranged in two diameters, the smaller for lifting 10 cwt. at 100 ft. per min., while the larger is arranged for lifting 5 cwt. at 200 ft. per min.

By means of a roller chain (breaking strain 20,000 lbs.), the drive is carried to a further shaft, on which are mounted the warping and the winch drums. The former has a pull of 1 ton at 50 ft. per min., while the cargo winch drum is capable of lifting 10 cwt. at 100 ft. per min.

SIMPLICITY OF CONTROL.

The controls are simple; the engine being governed. Once the latter is started, there is no need for the operator to give it any but casual attention; and there are, therefore, only two controls to consider. The first of these is the clutch lever, which has a movement of about 1 in. at the handle extremity. Even with brutal handling, it is difficult to produce any jar or susceptible strain. The brake is foot-controlled, and is strong enough to withstand far greater loads than those for which the winch is designed. Means for adjusting the chain driving the winch and warping drumshaft are provided for by carrying the shaft upon an eccentric mounting, which may be turned until it is equivalent to removing a link from the chain. There are many stages, of course, before this point is reached; and, as the chain is a short one, it is hard to imagine that a link would ever be required to be removed from it.

The cargo winch drum is arranged for 10 cwt. at 100 ft. per min. On test, the engine proves capable of lifting 14½ cwt.; and overloads up to 25 p.ct. are commonly met with in working conditions. When not in use as a winch, the apparatus makes an admirable stationary engine.

Particulars of Lloyd's Register Scholarships, Student Graduate Examinations, and Essay Competitions may be had from Mr. James Adamson (Hon. Secretary), 85-88, The Minories, Tower Hill, London, E., by junior engineers or apprentices having qualifications which should admit of their becoming candidates.

MUNICIPAL GOVERNMENT.

By Alderman F. J. WEST, C.B.E., J.P.

[From a Presidential Address to the Manchester and District Bankers' Institute.]

It is hardly necessary for me to insist on the importance of our own Municipality. Civic Week, which was celebrated at the commencement of the present month, had, I hope, some effect in bringing home to everyone that our Corporation is doing big things in a big way. Manchester takes her stand as an example of Municipal Government, both sound and enterprising, and as one of the greatest and most successful commercial and industrial cities in the world. It has been my lot to visit many of the principal cities both in Europe and in North America. During these visits, I have tried to take advantage of every opportunity of obtaining information and making comparisons between Manchester's municipal activities and those of other cities; and I give it as my considered opinion that we have every reason to be satisfied with the administration of public affairs in this city of ours.

Time does not permit of any detailed statement of the figures relating to the public utility services of our city; but the magnitude of only a few of the principal departments may be gathered from the fact that the combined capital expenditure of our trading departments—that is, the Water, Gas, Electricity, Tramways, and Market Departments—amounts to approximately 29 millions sterling. The total expenditure in the whole of the Municipal Departments during the year ended March 31, 1926, amounted to approximately 24½ millions, and the income to about a like sum for the same period; and these departments find employment for over 27,000 people. These impressive facts could be supplemented by many others, which establish not only the magnitude, but the wide variety of the activities engaged in by the Municipality; and my twenty-two years' experience of work in the City Council convinces me that this magnitude and variety of work, with its consequent problems, is more likely to increase and expand than to decrease.

AN APPEAL FOR GREATER INTEREST.

It is to be feared that the average ratepayer in any large city has no more than a very sketchy knowledge of the details of municipal business; and this inadequate knowledge inevitably leads to criticism of the wrong kind. The irritating effects of rates to pay and restrictions imposed by necessary regulations are more vividly present to the imagination than the vast amount of services efficiently, silently, and unobtrusively rendered. Constructive criticism is welcome and necessary; but the ratepayer who merely complains that the rates are high, without endeavouring to assess the benefits derived from municipal institutions, is both unfair and ungenerous. A closer knowledge of, and interest in, the work done would, in most cases, not only be educative, but would show that full value is obtained for the money expended, and would convince the would-be critic of the injustice of some of the unkind remarks which are levelled from time to time at the actions, views, and motives of municipal representatives.

The contribution of the Municipality to commence an industry is insufficiently realized. In its capacity as a Public Health Authority it seeks to secure healthful conditions of life, without which no form of enterprise involving human effort can hope to succeed. The activities of the Education Department are not limited to the inculcation of so much knowledge into the child-mind, but each child undergoes periodical medical and other inspection, supplemented by treatment, if necessary, enabling the child not only the more readily to assimilate the educational aspects of school life, but eventually to grow up into a healthy citizen, and thereby become an asset to the community. The large trading departments—gas, electricity, water, and tramways—are partners in every form of commerce and industry carried on in the city. Imagine for one moment what any large enterprise in Manchester would be without them. Therefore, putting the matter merely on the ground of personal interest, it is a sound investment for all professional and business men to take an active part and intelligent interest in the administration of these things which so closely affect their daily life and pursuits.

In view of the many important problems now confronting the Municipality, in addition to the complications and difficulties of the ordinary administration of the city's business affairs, I think no apology is needed for a strong appeal for a greater interest in municipal matters on the part, not only of ratepayers, but of those who, while they reside outside the city boundaries, earn their living and carry on their business within the city. It certainly suggests poor citizenship, as well as a lamentable and unwise lack of interest in their own business, that at the municipal elections during the last three years an average of less than 54 p.ct. of the electors took the trouble to record their votes, taking the contested elections alone. It has been said that all peoples get the government they deserve; and it is certain that more interest exhibited, particularly at election times, would give the necessary stimulus to those entrusted with the government of the city to bring a greater keenness to bear in the conduct of affairs. It would also give them that encouragement which they undoubtedly deserve as a reward for labours undertaken, often at considerable inconvenience and trouble to themselves.

One cannot help feeling that the apathy of the people prevents many good citizens from engaging in public work, and particularly from seeking entrance to the City Council. It explains to a very large extent that dearth of suitable candidates with which we are all familiar, and which presents a very formidable problem in municipal life. Surely there must be, in a city of such commercial reputation as ours, many excellent men and women with wide business experience and sufficient leisure to undertake what, after all, is the highest form of practical citizenship. I am convinced that we should have less destructive criticism, and fewer imputations of our motives and actions, if those who at present stand aloof and outside would come forward and take their part in the solution of the difficult and interesting problems which confront our community to-day.

BEST BRAINS REQUIRED FOR PUBLIC WORK.

I hope you will not think I am unduly critical in some of the foregoing remarks. Not for one moment would I presume to suggest that the policy and actions of our public administrators are above or beyond criticism. At no time more than the present—confronted as we are with an industrial and commercial depression which has lasted too long—have we needed to move forward with a cautious and well-thought-out policy. As a large ratepayer myself, I am fully cognisant of the excessive burden of national and local taxation, and of the need for relief rather than increased obligations in these respects. I realize with you that, in municipal affairs and in municipal enterprise, development and success can only be secured concurrently with the progress of the city's commerce and industry. We must not over-reach our foundations. The present time demands above all that there must be a wise consideration of the ratepayers' capacity to shoulder present and future burdens, if we are successfully to maintain our position in the world's markets.

Neither would I like you to imagine for one moment that I or my colleagues on the City Council are unmindful of, or, indeed, lacking in appreciation of—the valuable assistance and advice generously and unstintingly given from time to time by the leaders of commerce in this city, whether from the heads of your own profession or from the organized groups of business men. For instance, it is a source of great gratification that there is a close bond of co-operation between the Municipality and the Chamber of Commerce, with the Consulates, and with other important and representative organizations of Manchester's many activities. From all points of view, we need the assistance and advice of such experienced business men, not only as considerable ratepayers, but as members of the community with ability of immense public value, and in positions of such independence that they can render inestimable public service of a disinterested character. We want a larger and more wholesome life for our communities. We want our municipal services to be of the very best, judged by the highest standards of true economy and efficiency. We want them to be of the most profit, in the fullest sense of the word, to the community. The realization of these ideals can only be the product of the greatest possible competency in administration; and to secure this competency, the best brains and the widest experience of the city must effectively participate in the work.

Apart, however, from purely municipal problems, our large towns—and Manchester in particular—are more than ever becoming centres for organizations for the betterment of our social system and communal life, for the furtherance of education and scientific investigations, and for the general amelioration of the condition of the people. My experience last year in the Civic Chair gave me a much wider vision than I ever had before of Manchester's wonderful and inspiring activity in these directions. I was convinced that the citizens have cause for heartfelt gratification that in this work, lying outside directly municipal activities, the energy and concentration of effort on the part of public-spirited men and women in the city are bringing happiness and comfort to the sick, needy, and destitute—to old and young—and that their efforts are assisted by many thousands of good citizens in humble circumstances, contributing in many and diverse ways to the evolution of a healthier and brighter community. We have every reason to be proud of this noble form of citizenship.

INDUSTRIAL UNREST.

Proceeding to deal with the industrial situation, Alderman West said that consideration and appreciation of the human element were the first essential steps to the solution of industrial difficulties, and their contribution to such solution could only be successful after discovery of the principal causes of unrest. One particular aspect which he considered important was the disturbing effect of loose statement and false views on capital and labour. While it was true that some wealthy

people set a bad example by their extravagance, it was an entirely wrong conception that capital was held largely in their hands, or in the hands of any who were antagonistic to the working class. Capital was owned to an increasing extent by a very large proportion of the population. Only 10·8 p.c. of the national income was derived from land and houses.

—	£
British Dominion and foreign Government securities	170,000,000
Profits from the occupation of land and houses . .	51,000,000
Profits from businesses, professions, &c.	1,467,000,000
Weekly wage earners	320,000,000
Government and public company officials	650,000,000
Total	£2,488,000,000

This showed that wealth in this country was not derived in the main from inherited wealth or the possessions of the leisured classes.

The tactics of the class-war agitator would not really stand the slightest chance of success, if the fact could only be brought home to the people that all classes were inextricably involved in the ownership of wealth. The tendency to distribute wealth widely was an admirable one, and would do more to neutralize the revolutionary agitation of extremists than any amount of political polemics.

In conclusion, he said that disputes and unrest must mainly be ended by the force of public opinion, and that the community was under a definite moral obligation to try to reach a right conclusion on any industrial issue, and to use its influence to secure a fair and equitable settlement. It was also under an obligation to remove, as far as possible, contributory causes of unrest—such as profiteering, shortage of houses, unemployment, extravagance, and lavish display of wealth. A satisfactory solution to these difficult social problems would only be reached when each member of the community rendered unselfish service in the great cause of alleviating the sufferings of humanity. Human selfishness existed in all classes, and there was everywhere a far too narrow outlook on the possibilities of co-operation. The real antidote to industrial unrest and class antagonism could only be found in a strong, active, compelling principle that tended to bring all classes together, not for selfish ends, but to develop and cultivate a real spirit of brotherhood and good fellowship.

CURIOUS ASPECTS OF ATMOSPHERIC POLLUTION.

Extracts from a paper by Dr. J. S. OWENS, Superintendent to the Advisory Committee on Atmospheric Pollution, at a public meeting at Birmingham University to-day, under the auspices of the local section of the British Association of Chemists.

RESULTS FROM STANDARD DEPOSIT GAUGE.

The results obtained by this instrument give information not accessible in other ways—for example, the distribution of impurity over the 24 hours, which distribution varies remarkably in different places, but has certain general characteristics common to all, notably a comparatively pure air some time between midnight and 6 a.m. It is interesting to observe the growth and decay of a London smoke fog by this method; and the relation between the obstruction of light and the quantity of impurity thus measured has been examined experimentally by means of a special photometer. This shows that the percentage of light obstructed in 50 ft. amounts to about 15 with a suspended impurity of 1 milligramme per cub.m., and about 30 with 2 milligrammes per cub.m.

JET DUST COUNTER.

It is found by this instrument that in a smoke haze about 8000 to 10,000 particles per c.c. correspond to 1 milligramme per cub.m. as recorded by the automatic filter. The number of dust particles present in the air varies greatly, from 0 in mid-ocean to 80,000 or 100,000 per c.c. during a dense fog in London. During an ordinary winter day in London, without any special fog, there are 5000 to 6000 particles of soot per c.c. The numbers fall off rapidly to windward of a city. During a haze in Brighton, 1380 particles were found per c.c. In Hull during a smoke haze 13,800 were found, while on the same day outside Spurn Point there were only 140 per c.c. During a thick fog in London, 37,000 particles were found at 11 a.m., and at 2.50 p.m. the same day, after the fog had partly cleared, there were 6085.

RELATION OF DUST CONTENT TO ALTITUDE.

Some interesting observations have been made by the United States Weather Bureau, using the jet dust counter in aeroplanes and balloons. The upper limit of the dust haze often overlying the land is sometimes clearly marked, and forms what is called a "dust-horizon;" the air below being comparatively thick with suspended impurity, and the air above comparatively clear. No observations are available in England as to the vertical distribution of dust; but the Americans have made observations up to heights of 14,000 ft. which show a steady falling-off of the dust content with altitude. This, however, is not invariably true. It was found that with a clear sky there was more dust near the ground, and less between 2000 and 7000 ft. in the morning than in the afternoon. The increase in the dust content at high levels as day went on is evidently due to convection. Often with clear skies there were increases in the dust content up to 2000 to 5000 ft., accompanied by marked loss of visibility; the distribution being thus different under a clear sky and a cloudy one.

SPHERICAL BODIES.

Soon after the jet dust counter was devised, I observed that in city air there were nearly always a number of perfectly spherical bodies; and these were sometimes coloured and sometimes polished and transparent. Their dimensions were, of course, very small, of the order of 1 micron in diameter; but under a high power it was possible to use one of the transparent spheres as a lens, so that an image could be obtained of a body held under the microscope condenser. I was much puzzled by these bodies. The number present fluctuated greatly. Once, for example, in March, 1922, they reached about 50 p.c. of the total number of dust particles in London air. They were not soluble in water, xylole, or oil, nor were they hygroscopic. Their refractive index was a little under 1·54. They were subjected to all sorts of examinations, but the results were chiefly negative. For example, they would not stain with ordinary stains, they were unaffected by drying, and so on.

In view of subsequent experiments, there is little doubt that these particles are products of combustion, as the examination of any coal ash will show large numbers of spheres of a somewhat similar appearance. The ordinary boiler furnaces, hand or mechanically fired, show a fair number of spherical bodies in the ash, of different dimensions, but usually not more than about ½ mm. diameter. In the ash from pulverized fuel furnaces, the numbers are considerably greater, while I have isolated numbers of microscopical bubbles from the flue dust from a rotary cement kiln. The presence of these bodies in a deposit gives some indication of its source. Hence their identification has a definite practical value. I have, for instance, been enabled to say that a deposit suspected to have come from a coal unloading station really came from a chimney stack in the neighbourhood, since large numbers of these spherical bodies were found mixed with particles of fused ash and partially coked coal, while the dust from the coal unloading station consisted of unburnt fragments of broken coal.

IS DEEP BREATHING HARMFUL?

I was able to test the truth of the theory that the nose and respiratory passages form an effective filter, by using the jet dust counter, with suitable precautions, upon expired air. Briefly, it showed that nearly 70 p.c. of the dust in expired air passed through the nose on inspiration and expiration without being trapped. This was the case with ordinary breathing, while the last part of the reserve air, if expired, contained about 7 p.c. of the dust particles breathed in. After taking a few deep breaths, the percentage of dust particles in the reserve air rose to 21. The dust particles varied in diameter from 1·7 to about 0·8 microns in the air before breathing, while no particle over 0·85 micron was found in the expired air. The point of all this is that the dust in the air actually penetrates to the depths of the lungs, and that far more dust so penetrates during deep breathing than during ordinary breathing.

The practical bearing of it is that workmen in dusty occupations, if breathing quietly, may suffer very little, but if their work is such as to call for deep breathing, as, for example, it very often does with a miner, they are likely to suffer much more. It also raises the question as to the advisability of the deep breathing exercises, which are so often recommended, in air which is not comparatively dust free. It will be realized that the normal quiet breathing does not carry the tidal air mechanically into the deep parts of the lungs; the interchange being by diffusion. The air passages to which the ordinary tidal air reaches are lined with ciliated epithelium, Nature's provision for discharging the dirt deposited from the air. This epithelium has cilia, or fine hair-like processes, growing from the surface of the cells, which cilia are in constant movement, a sort of lashing upwards, which causes a flow of the secretions on the surface upwards, thus carrying away foreign particles which adhere to the lining of the air passages. If we breathe

deeply, the air, with its load of dust, penetrates beyond the parts provided with a ciliated lining, and there is no method of returning the dust. It may, therefore, be expected to be more injurious.

EFFECT OF THE COAL STOPPAGE.

The effect of the coal stoppage on atmospheric pollution has been somewhat curious. During the stoppage in 1921 there was a definite increase in the purity of the air. It was evident to everybody, since distant views which had practically never been seen before became visible. During the present stoppage, however, the conditions are not the same. It is not the stoppage of the mines which affects the atmosphere, it is the cessation of smoke production; and while in 1921 there was a marked diminution in smoke, that is not the case during the present year, at least in all places. Much of the foreign coal imported has been of such a soft and smoky nature that the amount of smoke evolved is in some places rather more than if there had not been a stoppage of the mines. The effect in London is not definite. Suspended impurity shows, if anything, a slight increase, while the deposited impurity has fallen off a little. An interesting case, however, is that of Stoke-on-Trent, where an automatic recorder has been installed. Here, owing doubtless to the closing down of the potteries due to the coal stoppage, the atmospheric impurity has been reduced remarkably during the months May to July inclusive. The average figure for these months during 1925 was 0·39 milligramme of impurity per cub.m. of air, while in 1926 this had fallen to 0·147.

LIGHTING PROGRESS.

Views on Development—before the Illuminating Engineering Society.

The opening meeting of the Illuminating Engineering Society took place at the E.L.M.A. Lighting Service Bureau, Savoy Street, W.C., on Tuesday, Oct. 26. It is usual to open the session of the Society by a survey of the chief events which have occurred during the vacation; and this fell to the lot of Mr. L. Gaster, the Hon. Secretary.

ABOLISHING SMOKE.

During the course of his remarks, Mr. Gaster said that the economic and hygienic consequences of loss of sunlight through the obscuring effect of a smoke-laden atmosphere are of direct interest to illuminating engineers; and in this field, representatives of the gas and electrical industries have found common ground for their united energies.

Much attention, continued Mr. Gaster, has naturally been devoted to the Government proposals for electrical supply; and it is satisfactory that the possibilities of co-operation between the gas and electrical industries in this matter are being explored by a Joint Committee, on which both are adequately represented. At the recent annual meeting of the Institution of Gas Engineers there were numerous expressions of the desire for such co-operation. Both industries are directly interested in the organization of efficient showrooms, in which the best methods of lighting can be effectually demonstrated. The number of showrooms suited for lighting demonstrations throughout the country is increasing, but there is doubtless room for extensions on a much greater scale.

PUBLIC LIGHTING.

The speaker went on to remark that there is a general feeling that ultimately the question of public lighting will become a national duty rather than a parochial one. Meantime it is suggested that the Ministry of Transport might be approached with a view to ascertaining (1) to what extent public lighting falls within the province of the Ministry; and (2) how far it is practicable for the Ministry to initiate experiments and, in conjunction with other bodies, formulate recommendations, on which ultimately legislation of the lighting of public highways might be based.

CO-OPERATION.

Having referred to the formation of the Dutch Illuminating Engineering Society, Mr. Gaster indicated the opportunities for international co-operation in illuminating engineering. The full resumption of the activities of the International Illumination Commission, he said, is already doing much to promote a common basis of action in different countries; and it is particularly gratifying that difficulties in connection with the participation of ex-enemy countries in the work of the Commission have been removed. At the next meeting of the Executive Council, which is to be held in Rome next year, the international relations existing before the war will be completely resumed.

DEVELOPMENT IN ELECTRIC LIGHTING.

A report was then submitted of the Committee on Progress in Electric Lamps and Lighting Appliances, of which Mr. S. H. Callow is Chairman. In this it was suggested that in the near future the smaller gasfilled lamps, such as are used for domestic and shop lighting, will be acceptable only in diffusing bulbs. The loss of light due to the diffusing coating, it was stated, is between 1 and 2 p.ct., and never exceeds the latter figure.

Regarding domestic lighting, attention was drawn to the demand for increased light in the home, due to the appreciation that this results in greater comfort, in the lessening of domestic labour, and in the avoidance of dirt; and to the demand for more artistic lighting, by the use of fittings and glassware designed to obtain well distributed and diffused light.

VALUE OF TWO-PART TARIFFS.

The report went on to say that the action of the supply companies and municipal electricity departments in introducing two-part tariffs for homes, which enable electricity to be obtained at low rates once a fixed charge to cover the "readiness to serve" has been paid, has "no doubt contributed largely to the willingness with which domestic users now instal comparatively large amounts of light."

As for shop lighting, the standard of illumination in windows two years ago would not have exceeded 8 or, possibly, 10 foot-candles. To-day the standard is getting nearer to 50 foot-candles, and in certain installations more than this. On the subject of street lighting, mention was made of the good work of the Institution of Public Lighting Engineers in investigating the requirements of good street lighting, and, more important still, in bringing to the notice of the lighting authorities of the various towns the benefits of efficient lighting in the prevention of crime and accidents—to say nothing of the convenience and comfort of those who pay the rates and use the streets.

Coal Ash Fusibility and Clinker Formation.

In a note contributed to the "Journal of the Franklin Institute," Mr. A. C. Fieldner states that the United States Bureau of Mines are conducting, at the Pittsburgh experiment station, tests of the fusibility of coal ash and the relation of such tests to the clinkering characteristics of the coal. While laboratory methods for determining fusibility of ash have been carefully investigated by the Bureau and standardized, no comprehensive study has hitherto been made as to how accurately such laboratory tests predict clinker trouble in burning coal. Seven different coals having a wide range of ash fusibility were tested for fusibility by the standard method worked out by the Bureau and by two other well-known methods. The coals were studied as to the distribution and composition of the ash-forming constituents, the sulphur content, and fusibility of ash. Firing tests were made on the same coals in a special hand-fired furnace developed by the Bureau engineers. The results of the fusibility tests were found to be indicative of the clinkering trouble that was experienced in burning the coals. The work is being continued on other coals.

High-Pressure Pipe Laying.—Mr. Paul Vecker, the Vice-President of the Panama-Colon Gas Company, has contributed to the "American Gas Association Monthly" an account of the laying of a high-pressure distribution system to serve a new outlying district—the first welded pipe that had ever been laid on the Isthmus of Panama. Standard 4-in. steel pipe in 40 ft. lengths, with bevelled ends, was used. On arrival the pipe was thoroughly wired and brushed, and given two coats of protective pipe paint—the first a thin priming coat, and the second a heavy bituminous coat. Both coats had an asphalt base. As the coatings were put on, about 6 in. at each end of the pipe was left free, so as not to interfere with the welding. A standard **U**-bend pipe was used at an average of every 2000 ft. The pipe was welded above ground, as many as fourteen lengths being welded together, and then welded on to the main line in the trench. By following this method, it was possible to have men with chain tongs, to roll the pipe as it was being welded, thereby ensuring a perfect job. The pipe was tested daily with 100 lbs. of air. To have a proper check on the tests, a double inspection was made. The pipe tested one day was lowered into the trench, and then tested again after lowering. Soapsuds were applied to all welded joints while the pipe was under pressure. In addition to this soapsuds test, the line was pumped up at night, pressures were taken, and these pressures checked in the morning before the air was released. By having a flange fitted with a gate valve tacked on the end, and the pressure released through this valve, all scale, as well as other particles of foreign substance which might have been left in the pipe, was blown out. Very little waste material was found in the pipe, as a swab was run through each length previous to its being placed in position for welding. After the pipe had been welded and tested, the welds and ends of the pipe were painted and coated, and all abrasions to the original coating which the pipe might have suffered in handling were touched-up.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Water Gas Plant for Small Works.

SIR,—We enclose a copy of a letter sent to Mr. Norton H. Humphrys regarding his article in the "JOURNAL" for Oct. 27 on "Water Gas for Small Gas-Works," in which he asks for evidence of practical working through a winter season

We notice in your leader that you say it is very doubtful if there would be any economy in operating two dissimilar processes of gas production in works making (say) 17 million c.ft. a year. Though the Newport Works are larger, they prove conclusively that there is an economy there; and this is confirmed at Dysart (16 million), though actual results covering twelve months are not yet available.

If you think the information may be of use to "O.K.," we should be glad if you would send it on. If he cares to communicate with us, we shall be pleased to supply any further particulars.

ED. LINSLEY,
Managing Director.

The Vertical Gas Retort Syndicate, Ltd.,
17, Victoria Street,
Westminster, S.W. 1,
Nov. 2, 1926.

[Enclosure.]

Nov. 2.

N. H. Humphrys, Esq.,
5, Wyndham Road,
Salisbury.

DEAR SIR,—

We notice in this week's "GAS JOURNAL" your article referring to a question by "O.K." as to water gas for small works.

We had the pleasure of putting before you particulars of the "Simplex" plant some time ago, and showing you an installation at work. Since then the plant has been redesigned, improvements have been carried out, and a number erected in works from 16 million to 30 million c.ft. per annum. We are able to give practical working results not only through a winter season, but over a period of nearly five years.

At Newport (Fife) a "Simplex" was put to work in January, 1922, and has worked continuously since, except for odd days when the (only) boiler was let down for inspection purposes. The cost of this plant was under £1000, its capacity 75,000 c.ft. a day. It is controlled by one interlocking lever, and is practically foolproof. The "blow" period is 4 to 5 minutes, and the "make" about 20 minutes.

As fewer retorts are required when the plant is at work, the stokers look after it, so that, though there are two manufacturing processes, there are no extra men. Indeed, there is actually a saving in labour, as extra men are not required during the winter months.

The saving per annum compared with results before the "Simplex" was installed was £621 the first year. Last year's saving was £941. Enclosed is a copy of the Engineer's statement for 1925-26.

Regarding maintenance, it may interest you to know that nothing has been spent on the plant itself. The turbo-blower, of course, has running repairs, but this amounts to very little. The generator has not been relined, nor a firebar renewed. The "Sydenham" grate is used, and there is no clinker. Next year, possibly, it may be necessary to reline, but only to a small extent, and at little cost, as a note was made of this after the last inspection.

At Ardrossan, a "Simplex" plant was put to work in September last year. We are enclosing an extract from local paper of the Gas Committee's report at the annual meeting in July last (with only 9 months' working of plant included), and also a copy of the same paper reporting a visit of the Scottish Junior Gas Association in September last.

You will notice on p. 9 of the pamphlet enclosed that the smallest works is at Dysart (16 million). The Manager claims that the introduction of the "Simplex" was the salvation of his Company, turning what was likely to be an adverse balance into one of the best years they have had.

The latest plant at Halstead (Essex) was brought into operation early in July. We enclose a copy of a letter received from Mr. Last a fortnight ago, which speaks for itself.

We trust the above information may be of interest to you. We are also sending a copy of this letter to the "GAS JOURNAL." Should you wish for further information, please let us know.

Yours faithfully,
ED. LINSLEY, Managing Director.

REGISTER OF PATENTS.

Removing Phenols from Gas Liquor.—No. 244,775.

HEFFNER, L. W., of East Norristown, and TIDDY, W., of Jeffersonville, Pennsylvania.

No. 31,646; Dec. 15, 1925. Convention date, Dec. 16, 1924.

According to this invention, instead of introducing cold liquor into the ammonia still, or, when the liquor is preheated, instead of running the free ammonia still with a reflux condenser or dephlegmator at a relatively low temperature, and refluxing most of the condensible ingredients from the vapours, the liquor in the still head is kept at a relatively high temperature, above 98° C., and a phenol absorber is inserted between the still and the ammonia condenser, to remove phenolic compounds from the gases. The percentage of phenol which is removed in the process depends on the temperature of the escaping vapours and of the liquor in the top of the free ammonia still, and on the ratio between the ammonia and phenol present in the gas liquor in the still. In general, the greater the proportion of ammonia to phenol, the greater will be the percentage of phenol removed from the gas liquor, up to the point where all the phenol is removed. If desired, additional ammonia may be added to the gas liquor or may be introduced into the still in order to increase the recovery of phenol and effect substantially complete recovery.

The invention includes a recovery system for purifying the ammonia from its admixed phenolic compounds and for recovering the phenols. The recovery system may be similar to the systems now used for absorbing and recovering phenols from other sources. For example, the admixed ammonia and phenolic compounds, in vapour form, and admixed with a relatively large amount of water vapour, may be passed through a suitable phenol absorber, such as an alkali washer in which the phenolic compounds are combined with the alkali as alkali phenolate.

Removing Phenols from Ammoniacal Liquor. No. 249,111.

STINNES, Z. E., of Essen-Ruhr.

No. 6234; March 5, 1926. Convention date, March 13, 1925.

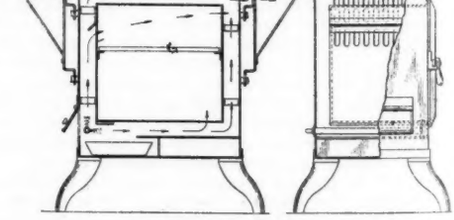
According to the processes hitherto known, state the patentees, the washing of ammoniacal liquor for the purpose of removing phenol therefrom is effected exclusively by means of benzene or its homologues. This process has the disadvantage that it does not make it possible to obtain the whole of the phenols of the ammoniacal liquor. According to the present invention, the above-mentioned objection is removed by adding to the extraction media hitherto employed organic bases of coke-plant tar or of low-temperature distillation tar, such as pyridine, quinoline, or their homologues, the boiling-point of which is preferably so high that the solubility in water of this class of substances is no longer in evidence. The greater cleansing action which is obtained with such a basic gas-washing oil is due to the chemical affinity of the bases for the acid phenols. Accordingly, the actual washing action in this process is to be attributed to the bases themselves, while benzene and its homologues are to be regarded as solvents or diluents for these substances, and may therefore be replaced by petrol or other neutral oils.

Cooking Stoves.—No. 259,047.

GLOVER, J. A. F., of Wandsworth, S.W. 18, BURN, L., of Morden, and RAPER, F. R., of East Hill, S.W. 18.

No. 26,946; Oct. 27, 1925.

This invention relates to gas cooking stoves of the kind in which the products of combustion of a burner located in a flue space between an enclosing casing and an oven pass upwards along the flue space around the oven and also circulate within the oven, entering and leaving the interior of the oven through apertures in the walls.



Novel Design of Cooker.

In the gas cooker according to the invention, a longitudinal burner extending rearwardly is located in the oven surrounding flue space at one bottom edge of the oven, and has a row of burner holes directing flames up the lateral vertical flue space immediately above, and another row of burner holes directing flames along the horizontal bottom flue space beneath the oven. A row of slots elongated in the direction of the flow of the products of combustion are pro-

vided, remote from the burner, in the respective vertical side wall and horizontal bottom wall of the oven; and the oven is vented at the upper edge diagonally opposite to the burner.

Other features will be remarked from the drawings which we reproduce—notably, the position of the grill burner below the oven space; the baffle protruding from the side wall to divert products through the oven; the flue forming one side extension; and the other side extension accommodating an auxiliary burner. Secondary air enters by way of the grill chambers. It will be noticed that cover plates are provided for the apertures in the hotplate, and that a door is provided for lighting and attending to the burner.

Quenching and Conveying Coke.—No. 259,325.

BARNES, A., and BROADHEAD, R. W., both of Huddersfield, and DEMPSTER, R., & SONS, LTD., of Elland.

No. 18,362; July 18, 1925. No. 21,177; Aug. 24, 1925.

The present invention, which combines several well-known principles, consists in coke quenching and conveying apparatus including a single horizontal quenching bench of capacity equivalent to that of one skip serving for use successively for a plurality of retorts, coke ovens, or the like. Other features also are shown on the diagrammatic front and side elevations of a convenient arrangement of plant.

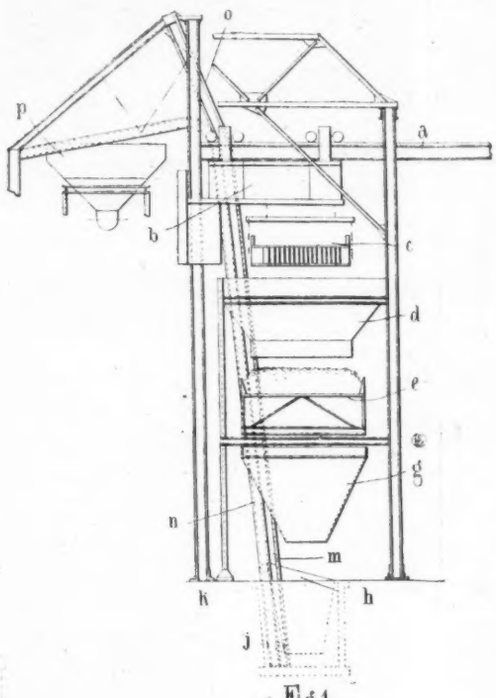


Fig. 1

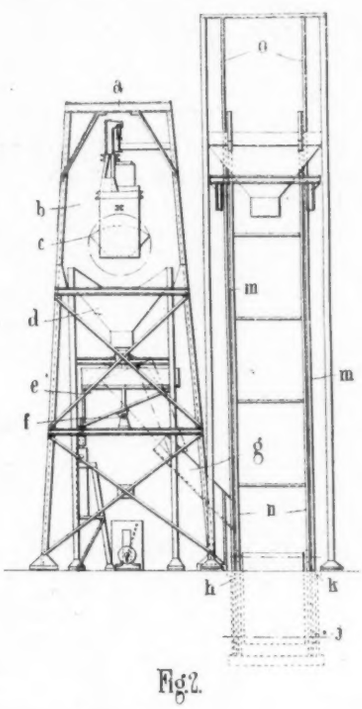


Fig. 2.

Coke Quencher and Conveyor.—R. Dempster & Sons, Ltd.

The telpher track *a* carries a telpher *b* and hot coke skip *c*. A chute *d* is provided to divert the discharged contents of the skip on to a single quenching bench *e*, which is carried upon a frame pivotally mounted at *f* to enable the bench to rest in a horizontal plane or to be tilted into an inclined position (shown dotted in fig. 2).

When tilted, the bench discharges its contents into a chute *g* which in turn delivers into a bucket *b* mounted on wheels *j*, *k*. The wheels *k* engage channel guides *n*, and the wheels *j* rest against angle-iron rails *m*. The latter are developed into channel guides *o*, so that the bucket is tipped to discharge its contents into the bucket or hopper *p* when elevated to its uppermost limit. The hopper *p*, which receives the full charge, acts in effect as a measurer, and discharges on to suitable feed apparatus (not shown) for horizontal or vertical screens or for any desired disposal.

The various operations may be performed automatically, being controlled by electric switches and tappets with or without relays, or may be operated directly under manual control.

The patentees point out that by dealing separately with small charges in this manner considerable simplification in quenching is achieved, as the coke is quenched in a thin layer instead of in bulk. Another advantage resides in the fact that by the dispensing with the long quenching bench and substituting a single short bench, the apparatus necessary to reclaim the coke after quenching is much simplified—for example, the coke may be conveyed into screens feeding storage hoppers by an elevator or inclined hoist as described. Further, disposal of the stream emitted on quenching is simplified.

Flag Wires of Gas Meters.—No. 259,377.

SIMPSON, S., of Exmouth.

No. 24,840; Oct. 8, 1925.

This invention relates specially to flag wires for dry gas meters of the kind in which the flag wire is provided in the form of a crank, the throw of which extends to the centre of the disc of the diaphragm, to which it is secured by means of bearings or the like provided upon the crank. The feature is that the upper and lower parts of the cranked flag wire are connected together by means of a strengthening rod; and the latter may be bent or curved to avoid contact with the leather part of the diaphragm.

Surrounds for Fireplaces.—No. 259,066.

HOPKINS, B. D., of Ealing, W. 13.

No. 30,677; Dec. 4, 1925.

The object of this invention is to construct a surround for gas or coal fires capable of being adjusted to suit the width of varying sized mantelpiece openings.

A frieze is constructed with two depending portions or side cheeks; and in these and the frieze are horizontal slots. There are jambs for each side, and screw-thread stems, for the nuts, project from the back at the desired positions.

The slots are of such length that the jambs can be adjusted on the frieze and cheeks to suit the width of opening of the existing mantelpiece. The whole may be of any suitable metal, or, if of wrought or cast metal, may be covered with other metal.

LEGAL INTELLIGENCE.

Alleged Requisition of Ship and Cargo.

In last week's "JOURNAL" it was mentioned that, on Oct. 29, in the King's Bench Division of the High Court of Justice, before Mr. Justice Wright, judgment was reserved in the case of Messrs. W. France, Fenwick, & Co., Ltd., *v.* The King. The suppliants were the owners of a steamer, the "Lockwood," which, in March, 1921, was chartered from them to bring a cargo of coal from Sunderland to London for the South Metropolitan Gas Company. The steamer arrived at Rotherhithe on April 1. She was to have discharged there; but, as the wharf was occupied by another steamer, she had to lie out at a buoy. On April 2, before she could begin to discharge, a Customs official came on board the "Lockwood," and said that, by reason of the coal strike, the Government had taken the cargo over. He said that it must not be unloaded, and that steam must be kept up, so that, if necessary, the steamer might take the coal to some other port. The "Lockwood's" boilers needed cleaning, but the Customs officials would not allow the work to be done. In the result the "Lockwood" was detained until April 22, when the Government requisitioned the coal. The vessel was then ordered to take the coal to Erith, and to discharge it there. Discharge was completed at Erith on the afternoon of April 23. The suppliants claimed damages for detention, for the cost of keeping up steam, and for the payment of the crew during the period of detention. Giving judgment on Nov. 1, Mr. Justice Wright declared that the suppliants were entitled to recover £100 in respect of April 22 and 23, 1921. They were not entitled to recover in respect of any further or other period.

MISCELLANEOUS NEWS.

GAS REGULATION ACT APPLICATIONS.

AMENDING ORDERS.

Aldershot Gas, Water, and District Lighting Company.

To substitute until Dec. 31, 1927, a standard price of 16·2d. per therm for the existing standard price of 14·4d. per therm.

Rudleigh Salterton Gas Company, Ltd.

To substitute for the maximum price of 19d. per therm a maximum price of 22d. per therm; and for 16d. per therm in section 4 of the existing Order, 19d. per therm. It is proposed that the new maximum price shall operate until Dec. 31, 1927.

Leatherhead Gas and Lighting Company.

To substitute for the existing standard price of 16·8d. per therm a standard price of 19·2d. per therm, until Dec. 31, 1927.

Wellington (Salop) Gas Company.

To substitute for the existing standard price of 14d. per therm a standard price of 16d. per therm for such period as the Board of Trade may determine.

SPECIAL ORDER.

Portsmouth Gas Company.

To provide for the transfer to the Company of the undertaking of the Emsworth Gas and Coke Company, Ltd., to make provisions as to the price to be charged for gas in that area, and to extend the area of the Portsmouth Gas Company to certain parishes beyond the district now supplied by that Company and the Emsworth Company.

"METRO" GAS HOME SERVICE EXHIBITION.

Cooking Competitions at Ladywell Baths.

With the object of demonstrating to the public of South London the many ways in which gas can serve them in their homes, a most interesting exhibition arranged by the South Metropolitan Gas Company was held last week at the Ladywell Baths.

As an illustration of the waste that occurs in the burning of raw coal, a special section at this exhibition demonstrated that, by carbonization, there is produced gas, coke, and 35 different coal-tar and ammonia products, all of which are wasted in the ordinary method of burning coal in open grates. Another section showed the applications of gas and coke for domestic use.

A free cooking competition was run in connection with the exhibition, for which the prizes were: First, a "Metro" gas fire; second, a "Metro" pendant (switch controlled); and, third, a "Metro" gas iron, with free fixing. There were cooking demonstrations daily, and music by the Lewisham orchestra.

INCREASES IN THE PRICE OF GAS.

The Ayr Gas Company have increased the price by 10d. per 1000 c.ft.

The Birmingham Gas Department have again increased the price by an all-round figure of 4d. per 1000 c.ft. The price for lighting, cooking, and domestic purposes is 4s. per 1000 c.ft., up to and including 100,000 c.ft. a quarter.

The Dunfermline Town Council have decided on a further increase in price of 10d. per 1000 c.ft. Three months ago a 4d. increase was made. The price stands now at 4s. per 1000 c.ft.

The Gas Light and Coke Company have issued the following statement: The Directors regret to announce that, as from the reading of the meter indices in December next, the price of gas will be increased by a further 1d. per therm. The Company feel sure that their consumers appreciate the fact that a full supply of gas is being maintained, notwithstanding that the coal stoppage has already lasted six months. The Company are meeting the difficult situation by the purchase of large quantities (already over 1¾ million tons) of foreign coal, at high and constantly increasing prices. In spite of these high prices, the total increase in the price of gas since the commencement of the coal stoppage is less than 25 p.ct.

In Helensburgh the price has been increased 1s. per 1000 c.ft., the rate now being 3s. 4d. to ordinary consumers and 3s. 7d. to prepayment meter users.

It has been reported to the Letterkenny (co. Donegal) Urban Council that they were continuing to lose on the gas-works; and it was decided to raise the price to £1 per 1000 c.ft., an increase of 7s. 6d.

At Lisburne the price has been increased by 1s. 6d. to 6s. 3d. per 1000 c.ft.

The price at Londonderry has been raised by 4d., to 1s. 3½d. per therm.

From the middle of the Christmas quarter, the price of gas in the area served by the South Suburban Gas Company will be increased by 1⅜d. per therm (approximately 7d. per 1000 c.ft.).

The Wick Gas Company, Ltd., intimate that the price will be increased 1s. 3d. per 1000 c.ft. as from the quarter ended Nov. 25. The present price is 5s. 10d., so that the new rate will be 7s. 1d. per 1000 c.ft.

The Hinckley Urban District Council have decided to borrow £24,649 for the construction of additional vertical retorts at their gas-works.

HOW TO OBTAIN COKE.

Opportunism in the Queues.

The depression of the coal strike is occasionally lightened by humorous incident. Gas managers throughout the country have been hard put to it to cope with the demand for coke. Queues for small quantities of this valuable fuel have commenced to form outside many gas-works—both large and small—in the early hours of the morning; and by eight o'clock the gateways at the works have had the appearance of test match entrances. Transport difficulties have been overcome by the employment of sugar boxes, small handcarts, and even perambulators, as is shown by a photograph sent to us by Mr. R. S. Ramsden, the General Manager and Engineer of the Leamington Priors Gas Company, which is reproduced here.

Coping with the Coke Problem at Leamington.

"YES, SIR, THAT'S MY BABY."

One of the large gas undertakings humanely decided that, whenever possible, mothers with babies should not be sent empty away. There followed a great borrowing of babies; and women without them were only too willing to take care of their neighbours' babies for an hour or two. As the undertaking could not afford an investigation staff to take thumbprints of all the babies, so that unfair advantage would not be taken of their policy of giving preferential treatment to mothers, it had to be modified.

WHOLESALE AND RETAIL.

There are always black sheep who rely on their wits to get the better of the community; and there have been many cases of opportunism of the baser sort in connection with coke queues. Enterprising "business men" have employed children to stand in the queue, obtain their portion of coke, and then hand it to their employers. After doing so, the children re-join the queue. In the meantime the "business men" retail the coke at enhanced prices.

Many more incidents such as the foregoing could be related; but space forbids. We will finish this brief article, commenced in the lighter vein, with a more earnest note. It is certain that the shortage of coal has introduced to thousands of homes a fuel—gas-works coke—the value of which, in many cases, was formerly unrecognized. And those responsible for the management of gas undertakings have earned the gratitude of consumers for the splendid way in which gas and coke supplies have been and are being maintained.

Good Year's Working at Colne.—In his report for the year ended March 31, Mr. F. Thorpe, the Engineer and Manager of the Borough of Colne Gas Department, states that the expenditure on revenue account during the year was £48,871, and the income £59,125, leaving a gross profit of £10,254. Interest and sinking fund contributions called for £9450, leaving a net profit of £803, which has been carried to the gas reserve appropriation account. After meeting extraordinary expenditure on plant repairs, which during the past five years has amounted to £7748, there still remains in the gas reserve fund a sum of £381. The total coal carbonized in the horizontal retorts and the hydrogen plant was 11,853 tons, together with 361 tons of coke, which was used in the latter plant for gas making. The quantity of gas made per ton averaged 20,773 c.ft. The total quantity manufactured was 246,219,000 c.ft., an increase of 10,703,000 c.ft. on the previous year.

Irish Gas Lighting Troubles.—The coal crisis has led the civic authorities in Dublin to order a reduction of public lighting and to suggest curtailment of private lighting, where possible. Very little coal is reaching the Free State capital, and there is little prospect of substantial cargoes for a considerable period. After midnight practically all the public gas lamps are extinguished, and also the great majority of the electric lamps. In fact, only at danger points are electric lamps left alight. The system causes no great inconvenience, except to a few night workers in the central area proceeding homewards. The Gas Order, however, operates rather drastically in the case of morning workers leaving their homes at an early hour, and having to pass through side streets and lanes. The chief country towns of the Free State have also had to dispense with public lighting to a large extent. In some instances lamps are only lighted for an hour or two. In Ennis the Administrative Council have directed the extension of gas lighting for the winter months.

NORTH-EAST COAST COAL TRADE.

From our Own Correspondent.

Collieries are viewing coal trade prospects in more and more optimistic vein as time goes on, which means, as far as this district is concerned, that they are relying upon sustained demand for export. In spite of all efforts of our foreign competitors during the strike, it is felt that there is now a shortage of coal on the Continent, and prices at which Germany has been able to make certain forward contracts are encouraging the belief that the demand for British coals will not be merely of two or three months' duration.

It is reported that good gas coal has been sold for delivery shortly after the resumption of work at 27s. 6d. f.o.b. Generally speaking, collieries indicate something like 25s. f.o.b. for good qualities for three months, 22s. 6d. for six months, and 20s. for the year. Most producers have, of course, large arrears to deliver under pre-strike contracts at very much lower figures than these; deliveries due during the last six months being, in most cases, merely postponed. It remains to be seen whether the present optimism is justified; but, taking into consideration arrears under old contracts, it will require a very good market to recoup collieries for their losses through the strike. Another point that should not be overlooked is that the good prices which are bound to prevail for at any rate two or three months will raise the wage rate and costs of production in subsequent months under the type of profit-sharing agreement which seems to have become an established principle.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From our Local Correspondent.

The situation during the past week has been localized to some extent owing to the dribbling back to work of miners, which has resulted in an increase of output of coal throughout the country. Some gas-works are, I hear, rather short of stocks, but their requirements are being met by deliveries through various channels.

COAL TRADE IN THE MIDLANDS.

From Our Local Correspondent.

Collieries which are working are finding very profitable outlets for all the coal they can produce, whatever its grade. Those which are linked with the iron and steel trades are able to render a certain amount of assistance to their ancillaries; but it is mainly in the provision of slacks and other low grades. There are indications of renewed initiative at some of the iron and steel works. In all save a very few cases, however, attempts to re-start idle plants are deterred by the difficulty of maintaining supplies. That the attempt should be made at some of the works is evidence of a belief that the deadlock is nearing its end quite as much probably as of assured supply under conditions which now obtain.

The new phase upon which the control is entering makes the work of the distributors more harassing. It is suggested that the greater rigidity of the allocation scheme will entail, first, congestion of supplies, then shortage in administrative areas where allowances have been on a comparatively liberal scale. In some areas a period of grace has been obtained before the application of the new regulations, as the machinery cannot be got ready. Feverish conditions have characterized the market. Values have tended to harden rather than otherwise. Increased pressure for slacks and smalls for the electricity undertakings, together with the larger demands for central heating, aggravate the stringency.

STOKER'S FATAL BURNS.

Questions in Ulster Parliament.

Three fires have recently occurred at the Belfast Gas-Works. The third outbreak was rather more serious than the other two, as three stokers sustained severe burns to the face and hands. One, Alexander Martin, was in so grave a condition that a transfusion of blood was resorted to on his admission to hospital. All, however, was in vain, as he succumbed next day. The injuries were caused by a backblast due to the foreign coal. The men were working on a platform on top of some of the retorts, when the gas ignited, and set fire to loose dust or "breeze," and the flames, shooting upwards, had the men on the platform at their mercy.

These fires and the paucity of information concerning them were the subject of questions in the Ulster Parliament. Mr. J. Devlin asked the Minister of Commerce whether his attention had been called to the fact that three fires had occurred within a few days at the Belfast Gas-Works, whether the Minister would make a full statement of the circumstances leading up to the fires, and whether the outbreaks were due to the quality of the coal imported.

The Minister of Commerce said he had noticed the Press reports. From inquiries made, however, he was satisfied that the fires were not of a serious nature.

While the maximum legal charge at Ballymena is 7s. 6d. per 1000 c.ft., gas costs 10s. per 1000 c.ft. to produce. The loss up to the end of October was nearly £3000. The Clerk wrote to the Home Office pointing out the position, and asked the Ministry for permission to overdraw the account, or else settle with the bankers for an overdraft of (say) £4000, for a period of six months. The Ministry consented to the borrowing by way of overdraft.

Coin Collecting Made Easy!

SAVE YOUR TIME & LABOUR BY USING

THE MODEL COIN COLLECTOR

SAWER & PURVES (BRANCH OF METERS, LTD.) MANCHESTER - - LONDON - - NOTTINGHAM

TRADE NOTES.

"Dryco" Coke Cookers.

In our account of a visit to the Fuel Research Board's Station at Greenwich (*ante*, p. 301), we mentioned that the coke from the horizontal settings was dry cooled by "Dryco" water-cooled cylindrical vessels. The "Dryco" cooler is manufactured and supplied by Messrs. Aldridge & Ranken, Ltd., of Bath (London address: 39, Victoria Street, S.W. 1).

Refractories.

The Derbyshire Silica Firebrick Company, Ltd., of Friden, have published an interesting booklet describing and illustrating their product. The following is an extract from the booklet: A fireclay brick starts to give way under pressure at a certain temperature, which varies according to the pressure applied; the greater the latter, the lower the temperature at which it begins to yield. As the temperature continues to rise, the fireclay becomes more and more fluid, and the deformation increases until the brick becomes completely flattened. On allowing the piece to cool, it becomes hard again, very little actual disintegration having taken place. Straight silica brick (*i.e.*, bricks containing upwards of 92 p.ct. of silica and a minimum of alumina) remain firm under pressure up to a certain temperature, and then give way suddenly; the material disintegrating without actual fusion. On cooling, the material remains in a disintegrated condition. Derbyshire silica firebricks combine the advantages of both fireclay and pure silica without the disadvantages described above. They are highly resistant to pressure up to 3000° Fahr.; above this they begin to soften, but do not disintegrate or give way suddenly.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Nov.* 8.

Prices in the London tar products market continue firm, and supplies generally are scarce.

Business in pitch is possible at 200s. per ton f.o.b. makers' works.

Creosote is firm at about 9d. per gallon net and naked.

Tar spirits continue in demand. Pure benzole is firm at about 3s. per gallon, pure toluole is about 3s. to 3s. 3d. per gallon, and 95/160 solvent naphtha 2s. 1d. to 2s. 2d. per gallon.

Crystal carbolic acid has advanced to about 7d. per lb., in large drums and overcasks.

Other products are unchanged.

Tar Products in the Provinces.

Nov. 8.

The market for tar products remains very firm.

Pitch is still in very good demand, and prices have increased.

Creosote supplies are short, and prices show upward tendency.

There has been an improvement in the market for crude carbolic and crystals.

The average values of gas-works products during the week were: Gas-works tar, 120s. to 125s. Pitch, East Coast, 195s. to 197s. f.o.b. West Coast—Manchester, 187s. 6d. to 190s.; Liverpool, 190s. to 193s.; Clyde, 193s. 6d. to 195s. 6d. Benzole, 90 p.ct., North, 1s. 11d. to 2s.; crude, 65 p.ct. at 120° C., 1s. 4d. to 1s. 5d., naked at makers' works; 50-90 p.ct., naked, North, 1s. 11d. to 2s. Toluole, naked, North, 1s. 11d. to 2s. nominal. Coal-tar crude naphtha, in bulk, 9d. to 9¼d. Solvent naphtha, naked, North, 1s. 9d. to 1s. 10d. Heavy naphtha, North, 1s. 1d. to 1s. 2d. Creosote, in bulk, North, liquid, 8¼d. to 8¾d.; salty, 7⅝d. to 8d.; Scotland, 7⅝d. to 7¾d. Heavy oils, in bulk, North, 7¼d. to 7⅜d. Carbolic acid, 60 p.ct., 1s. 5d. to 1s. 6d. prompt. Naphthalene, £11 to £14; salts, 90s. to 100s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

SULPHATE OF AMMONIA.

Increase of Prices.

Mr. F. C. O. Speyer, the General Manager of the British Sulphate of Ammonia Federation, Ltd., informs us that, owing to the continuation of the coal stoppage, the Federation are having to ship sulphate of ammonia for the home market which they would otherwise send by rail, and are incurring heavier railway carriage. In view of this they have decided to increase the prices for sulphate of ammonia by 5s. per ton. This increase to take effect as from Nov. 1. The increased prices for neutral quality will, therefore, be as follows: November, 1926, £11 16s. per ton; December, £11 18s. per ton; January, 1927, £12 per ton; February, £12 3s. per ton; and March, April, and May, £12 6s. per ton. All other terms and conditions as per the circular, dated July 31 last.

"Clean Air."—It has been decided to issue, as the official organ of the Smoke Abatement League of Great Britain, a periodical entitled "Clean Air." It is hoped that the first number may be brought out well before Christmas; but its continuance will depend to a large extent on the initial support received.

Praise for Gas Engineer and Staff at Shipley.—At a recent meeting of the Shipley Urban District Council, the Gas Committee decided to place on record their appreciation of the efforts of the Engineer (Mr. H. Burton), staff, and workmen during the difficulties caused by the coal dispute. The serious loss which is being sustained by the department owing to the present high price of coal was referred to; and it was decided that a statement be prepared showing its effect on the finance of the undertaking.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Nov. 3.]

Nos. 26,563—27,253.

BAILEY, R. W.—"Valves for gas and oil power plant." No. 26,682.

BERRY, M. C.—"Gas fire-lighters." No. 26,841.

CARMICHAEL, J. F., and CARMICHAEL & Co., LTD., J. F.—"Distillation of tar, &c." No. 26,956.

CARPENTER, C. C.—"Gas producers." No. 27,162.

CHAMBERLAIN & HOOKHAM, LTD.—"Prepayment meters." No. 26,720.

JAMES, S.—See Chamberlain & Hookham, Ltd. No. 26,720.

JOHNSON, B.—"Method of treating aqueous emulsion of tar." No. 26,892.

KOPPERS COKE OVEN CO., LTD., and KOPPERS, H.—"Apparatus for cooling coke." Nos. 27,123, 27,124.

LEVINSOHN, S. S.—"Gas testing apparatus." No. 27,029.

METROPOLITAN-VICKERS ELECTRICAL CO., LTD.—See Bailey, R. W. No. 26,682.

MOURAT, L. J.—"Gas oven." No. 26,891.

SHEPPARD, H. P.—"Gas compressors." No. 27,130.

SOCONY BURNER CORPORATION.—"Combustion systems." No. 26,807.

SOUTH METROPOLITAN GAS COMPANY.—See Carpenter, C. C. No. 27,162.

WHITE, A. E.—See Socony Burner Corporation. No. 26,807.

CONTRACTS OPEN.

Steel Mains and Specials.

The Gas Department of the Pontypridd Urban District Council are inviting tenders for the supply and delivery of steel mains and specials. [See advert. on p. 380.]

Rate Relief at Abertillery.—The Abertillery Gas Department have contributed a further £1330 to the relief of the rates, making a total of £3830 for the year.

Newcastle and Gateshead Gas Company's Sale.—The result of the Newcastle and Gateshead Gas Company's annual twelve-days' sale is that the orders taken for gas consuming appliances are double those of last year's sale. The orders include 2450 fires, of which 40 p.ct. were sales; and 470 cookers, of which 33 p.ct. were sales. More than 300 wash boilers and water heaters were sold; also 350 grillers and rings, and over 900 lighting burners, in addition to some thousands of sundry articles—such as shades, mantles, spark lighters, cooking utensils, &c.

Nottingham Gas Prices.—Naturally, the greatly enhanced price of coal has given rise to fears as to a possible early increase in the price of gas at Nottingham; but such misgivings have for a time been set at rest by the assurance which has been forthcoming from Alderman Sir Albert Ball (the Chairman of the Gas Committee), who has indicated within the last few days that that body have not yet contemplated such a contingency. The Committee recognize that matters are not at their best in the city at this period, and that they ought to help all sections of the community, as far as they possibly can, through a difficult time.

"English and Amateur Mechanics."—It is announced that the two weekly technical papers "English Mechanics and the World of Science" (founded in 1865) and "The Amateur Mechanic and Work" (first published in 1887), have recently combined, and now appear as a single but enlarged publication, at the old price of 3d. These pioneer weeklies have, to some extent, run on parallel lines in the past in catering for the craftsman, amateur mechanic, and woodworker, and also those with scientific and other hobbies. Advantage has been taken of the present opportunity to modernize the combined paper, and to present it in an attractive form. The new publication bears the title of "English and Amateur Mechanics."

Gas Department and Electricity Generation.—Some time ago the Burnley Town Council appointed an expert, Mr. W. H. Patchell, of Westminster, to advise on the Gas Department's proposal to instal their own plant for generating electricity required at the new gas-works at Old Hall. It was thought at the time that the Department could not do it at the low figure given, and the Electricity Department regarded it as impracticable. The expert's report has now been received, and he says the scheme has been "well conceived," and that it will be to the advantage of the Gas Department to generate their own supply of electricity. The report has been considered by the Gas Committee, who have re-affirmed their desire to generate electricity at Old Hall.

The Dungannon Urban Council have passed a resolution unanimously congratulating Mr. D. M'Intyre, the Gas Manager, on being able to maintain a good gas supply after six months of the coal strike.

The evening of Sunday, Oct. 24, was cold and dreary at Stanhope. A downfall of snow synchronized with a failure of the gas supply, due to lack of coal. Church services were conducted with the aid of candles.

The Birkenhead Corporation have received the Ministry of Health's sanction to the borrowing of £27,500 for the laying of high-pressure gas mains to Heswall. One-half of the interest on the loan raised to cover the expenditure will be met by the Unemployment Grants Committee.

At a meeting of the Gas Committee of the Skegness Council, the Manager (Mr. F. Young) stated that, despite the appeal to individual consumers to be economical in the use of gas, the consumption for October was 24 p.ct. in advance of the corresponding month last year, and was 10 p.ct. up on the September figures. It was agreed to issue a further appeal for economy.

STOCK MARKET REPORT.

THE conference between the miners' leaders and the Trade Union Council, which at the close of last week led up to the renewal of negotiations with the mine owners, indicated that there was at last a genuine desire to come to terms; and with the prospect of a speedy settlement of the long drawn-out dispute, there was an immediate improvement in the Stock Exchange markets. Gilt-edged stocks, Home Rails, and certain Industrials were all firmer.

The anticipated, but none the less extraordinary, response to the Belgian loan issue—applicants for which in some cases received only 1 p.ct. of the amount applied for—has led to considerable discussion of the objectionable practice of "stagging." Many genuine investors were either crowded out or were deprived of a fair allotment; but it is realized that it is a very difficult matter to deal with.

The chief interest in the Industrial section was centred in the shares of the chemical combine; and while prices were generally higher, a reaction occurred in Brunner Monds on profit-taking.

The Gas Market did not benefit by the more hopeful news with regard to coal supplies. The Gas Light, South Metropolitan, and South Suburban ordinary stocks all eased off, though there were no reductions in quotations. The first-named stock will not be improved by the announcement broadcasted on Friday, and published in the Press on Saturday, of a further increase in the price of gas as from December.

The following transactions were recorded during the week:

On Tuesday, Bombay 20s. 6d., 21s., British 104½, Commercial 4 p.ct. 78, Gas Light and Coke 84, 84⅛, 84¼, 84⅝, 84⅞, 3½ p.ct. maximum 59, 59½, 60⅛, 4 p.ct. preference 75½, 76, 3 p.ct. debenture 58½, 59¼, Hong Kong and China 19⅝, Imperial Continental 133, 3½ p.ct. debenture 69, Newcastle 3½ p.ct. 70⅜, Primitiva 12s. 3d., 12s. 4½d., 12s. 6d., 12s. 7½d., 12s. 8⅛d., 12s. 9d., South Metropolitan 92½, 3 p.ct. debenture 58½, South Suburban 5 p.ct. 97, Wandsworth 3 p.ct. debenture 56½. Supplementary prices, Chester 5 p.ct. 87½, Gas Light and Coke 5 p.ct. debenture (interest from Sept. 1, 1926) 100⅛, 100½ (interest from July 8, 1926) 100¾, 101, Hornsey 5 p.ct. preference 85, Montevideo 6 p.ct. debenture 98½.

On Wednesday, British 104½, 105, Gas Light and Coke 84, 84⅛, 84⅜, 84⅝, 3½ p.ct. maximum 59, 4 p.ct. preference 75½, 3 p.ct. debenture 58½, Newcastle 3½ p.ct. 70⅜, Primitiva 12s. 7½d., South Metropolitan 91½, 92, Uxbridge, Maidenhead, 5 p.ct. preference 83. Supplementary prices, Gas Light and Coke 5 p.ct. debenture (interest from July 8, 1926) 101, Hartlepool 5 p.ct. maximum 84⅜, Hornsey 5 p.ct. preference 86.

On Thursday, Alliance and Dublin 84⅛, 84½, 84⅜, British 104, Cape Town 7¾, European 6⅞, 7, Gas Light and Coke 83⅜, 84, 84⅛, 3½ p.ct. maximum 59, 3 p.ct. debenture 58½, Imperial Continental 134, 134⅜, 135, Newcastle 3½ p.ct. debenture 67, Primitiva 12s. 4½d., 12s. 6d., 12s. 8½d., 12s. 9d., South Metropolitan 91½, 92, South Suburban 97¼, Wandsworth Wimbledon, 5 p.ct. 100, 100½. Supplementary prices, Gas Light and Coke 5 p.ct. debenture (interest from July 8, 1926) 101, Montevideo 6 p.ct. debenture 98½.

On Friday, Alliance and Dublin 84, 84⅛, British 104½, 105, Continental Union 28, 28⅛, Gas Light and Coke 83⅝, 83⅜, 84, 84⅛, 84¼, 3½ p.ct. maximum 59⅜, 3 p.ct. debenture 59½, Imperial Continental 134, 136, Newcastle 3½ p.ct. debenture 67½, Primitiva 12s. 9d., 12s. 9¼d., 12s. 10½d., 13s., 13s. 1½d., South Metropolitan 91½, 92, South Suburban 5 p.ct. 97½, 97⅜, 98. Supplementary prices, Gas Light and Coke 5 p.ct. debenture (interest from July 8, 1926) 101, Worthing 89¾.

In Lombard Street exceptionally easy conditions prevailed at the close of the week. The charge for overnight balances was reduced to 3⅜ p.ct., and new money was available at 3½ p.ct. The average rate at which Treasury Bills were allotted was higher than had been anticipated; being £4 17s. 7·69d. p.ct., or 6·63d. p.ct. above the previous week. This average had been exceeded once only during the current year.

In the Foreign Exchange Market there was rather more activity than usual. On Thursday there were extensive sales and purchases of dollars on French official account, and there was a considerable improvement in the value of francs. The rapid rise is, however, causing some anxiety in French banking circles. At the close, Francs were quoted at 146¾; Belgas 34.82½; Lire 112⅜; and Sterling 4.84⅛.

Silver was quiet, and the price declined to 24⅝d. per oz. Gold remained at 84s. 11½d. per oz.

The Bank Rate is 5 p.ct., to which it was raised from 4 p.ct. on Dec. 3. Bankers' deposit rates are 3 p.ct. The deposit rates of the discount houses are 3 p.ct. at call and 3½ p.ct. at notice.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr	Dividends. Last Hf. Yr.	NAME.	Quotations. Nov. 5.	Rise or Fall on week.	Transactions Lowest and Highest Prices.
£			%p.a.	% p.a.				
171,978	Stk.	Aug. 12	5	5	Aldershot 5 p.c. max. C.			
322,992	"	"	4	4	Do. 4 p.c. Pref.	72—75	..	..
1,551,868	"	Sept. 30	4	4	Alliance & Dublin Ord.	65—70	..	..
374,000	"	July 8	6½	6½	Do. 4 p.c. Deb.	83—88	..	..
300,000	1	Oct. 14	4	4	Bombay, Ltd.	67—70	..	84—84⅜
170,000	10	Aug. 26	1/7½	1/7½	Bournemouth 5 p.c.	1—1¼	..	..
500,050	10	"	8½	8½	Do. B 7 p.c.	12—13	..	20/6—21/-
275,000	10	"	7	7	Do. Pref. 6 p.c.	12—13	..	..
50,000	Stk.	June 24	6	6	Do. 3 p.c. Deb.	11—12	..	..
162,025	"	"	3	3	Do. 4 p.c. Deb.	54—57	..	..
214,740	"	Aug. 26	4	4	Brighton & Hove Orig.	74—77	..	..
244,200	"	"	12	12	Do. A Ord.	163—168	..	..
1,327,500	"	July 22	9	9	Bristol 5 p.c. max.	125—130	..	..
855,000	"	Sept. 30	5	5	British Ord.	86¼—87¼a	..	..
100,000	"	June 24	7	8	Do. 7 p.c. Pref.	102—107	..	..
120,000	"	"	7	7	Do. 4 p.c. Red. Deb.	114—119	..	104—105
100,000	"	"	4	4	Cape Town, Ltd.	68—73	..	..
100,000	10	June 10	6	8	Do. 4½ p.c. Pref.	7—8	..	..
150,000	10	Oct. 28	4½	4½	Do. 4½ p.c. Deb.	6—7+	..	7⅜
636,860	Stk.	June 24	4½	4½	Cardiff Con. Ord.	68—73	..	..
237,860	"	July 22	6	6	Do. 7½ p.c. Red. Deb.	94—97	..	..
157,150	"	June 24	7½	7½	Chester 5 p.c. Ord.	99—102	..	..
79,185	"	Aug. 12	6½	5	Colombo Ltd. Ord.	88—93b	..	..
24,495	1	Sept. 30	†2/-	†2/-	Do. 7 p.c. Pref.	27/—29/-	..	..
1,513,280	Stk.	"	1/4⅜	1/4⅜	Commercial 4 p.c. Cap.	20/—22/-	..	..
560,000	"	Aug. 12	5½	5½	Do. 3½ p.c. Cap.	77—80	..	..
475,000	"	"	5/3¾	5/3¾	Do 3 p.c. Deb.	74—77	..	78
300,000	"	June 24	3	3	Continental Union, Ltd.	55—58	..	..
200,000	"	Sept. 30	‡2	‡1	Do. 7 p.c. Pref.	27—32	..	..
737,150	"	"	7	7	Croydon sliding scale	82—86	..	28—28½
403,100	"	Aug. 12	6½	6½	Do. max. div.	96—99	..	..
492,270	"	"	6	5	Derby Con.	78—81	..	..
55,000	"	Aug. 26	9	6	Do. Deb.	107—109c	..	..
209,000	"	June 24	4	4	East Hull Ord. 5 p.c.	73—75c	..	..
50,000	"	Sept. 16	5	5	Eastbourne 5 p.c. Deb.	84—87	..	..
1,002,180	"	June 24	5	5	European, Ltd.	91—96	..	..
18,788,960	10	Sept. 30	†4	†3	Gas Light & Coke 4 p.c. Ord.	6¾—7½	..	..
2,600,000	Stk.	Aug. 12	4/17/4	5/1/4	Do. 3½ p.c. max.	83½—85½	..	6¾—7
4,157,020	"	"	3½	3½	Do. 4 p.c. Con. Pref.	58—61	..	83⅝—84⅜
5,602,620	"	"	4	4	Do. 3 p.c. Con. Deb.	74—77	..	59—60⅛
181,315	"	June 24	3	3	Do. 6 p.c. Br'tf'd Rd. Db.	58—61	..	75¼—76
180,000	"	"	—	—	Do. 10 p.c. Bonds.	100—105	..	58⅛—59½
42,000	"	—	10	10	Do. 7½ p.c. Ilford Deb.	..	..	..
82,500	"	Aug. 26	7½	7½	Hastings & St L. 5 p.c. Cons	..	..	..
258,740	"	"	6¾	6¾	Do. 3½ p.c. Conv.	87—92	..	..
70,000	10	Oct. 14	5½	5½	Hongkong & China, Ltd.	66—71	..	..
173,200	Stk.	Sept. 16	†10	†10	Hornsey Con. 3½ p.c.	19—20	..	..
1,976,000	"	May 20	5	5	Imperial Continental Cap.	69—71	..	19⅜
226,170	"	Aug. 12	10	†10	Do. 3½ p.c. Red. Deb.	132—137	..	..
235,242	"	Aug. 12	3½	3½	Lea Bridge 5 p.c. Ord.	68—71	+2	133—136
2,127,340	"	Aug. 12	6½	6½	Liverpool 5 p.c. Ord.	92—97	..	69
600,000	"	Aug. 12	5½	5½	Do. 7 p.c. Red. Pref.	80—81b	..	..
165,736	"	Sept. 30	7	7	Maidstone 5 p.c. Cap.	102—105b	+½	..
63,480	"	Aug. 26	8	9	Do. 3 p.c. Deb.	112—117	..	..
75,000	"	June 24	3	3	Malta & Mediterranean	53—58	..	..
541,920	Stk.	June 24	†6	†7	Montevideo, Ltd.	54—5⅝	..	..
2,061,315	"	May 20	†4	†6	Newcastle & Gateshead Con	80—83	..	..
360,929	"	Aug. 12	5	5	Do. 4 p.c. Pref.	70⅜—71½ d	..	..
529,705	"	"	4	4	Do. 3½ p.c. Deb.	73—74d	..	..
15,000	"	June 24	3½	3½	North Middlesex 10 p.c.	67½—68½d	..	..
91,530	"	Aug. 26	11½	11½	Do. 7 p.c.	151—156	..	..
300,000	"	"	8⅜	8⅜	Oriental, Ltd.	109—114	..	..
188,190	"	May 6	9	7	Plym'th & Ston'house 5 p.c.	97—102	..	..
414,500	"	June 24	7¼	7¼	Portsm'th Con. Stk. 4p.c Std.	108—113	..	..
236,732	"	Aug. 26	7¼	7¼	Do. 5 p.c. max.	102—107	..	..
2,289,909	"	"	—	7/4/0	Primitiva Ord.	78—81	..	..
382,200	1	—	—	5/0/0	Do. 4 p.c. Red. Deb.	12/3—13/3	..	..
600,000	100	June 1	4	—	Do. 4 p.c. Red. Deb.	84—86	+ /3	12/3 - 13/1½
180,305	Stk.	July 22	4	4	Do. 4 p.c. Red. Deb. 1911	69—71	..	..
256,847	"	June 24	4	4	Do. B. Aires 4 p.c. Rd. Db	69—71	..	..
150,000	"	"	4	4	Do. R'r P'te 4 p.c. Rd. Db.	69—71	..	..
125,000	10	Sept. 30	6	4	San Paulo 6 p.c. Pref.	7½—8	..	..
270,000	50	July 1	6	6	Do. 5 p.c. Red. Deb.	46—49	..	..
419,968	Stk.	Sept. 16	5	5	Sheffield A	97—99e	..	..
1,047,000	"	"	6	5⅝	Do. B	97—99e	..	..
90,000	"	"	6	5⅝	Do. C	97—99e	..	..
6,609,895	10	June 11	4	—	South African	5—7	..	..
1,895,445	Stk.	Aug. 12	7	5	South Met. Ord.	90½—92¼	..	..
734,000	"	July 8	3	3	Do. 3 p.c. Deb.	57—60	..	91½—92
91,500	"	Sept. 16	3	3	Do. 5 p.c. Red. Deb.	100—102	..	58⅝
1,187,795	"	Aug. 12	6½	6½	South Shields Con.	114—116d	..	..
868,837	"	Aug. 12	8½	8½	South Suburban Ord. 5 p.c.	96—98	..	..
647,740	"	June 24	6½	6½	Do. 5 p.c. Deb.	92 95	..	97—98
121,275	"	Oct. 14	5	5	South'mpton Ord. 5 p.c.max	75—78	..	..
250,000	"	June 24	5	5	Do. 4 p.c. Deb	68—73	..	..
200,000	"	Aug. 26	4	4	Swansea 7 p.c. Red. Pref.	100—102	..	..
120,000	"	June 24	7	7	Do. 6½ p.c. Red. Deb.	100—102	..	..
882,275	"	July 22	6½	6½	Tottenham District A 5 p.c.	105—110	..	..
150,000	"	"	7½	7½	Do. B 3½ p.c.	88—91	..	..
181,255	"	"	6½	6½	Do. 5½ p.c. Pref.	99—101	..	..
258,251	"	June 10	5¼	5¼	Do. 4 p.c. Deb.	73—76	..	..
	"	Aug. 26	4	4	Tynemouth Con. and New	67 - 68d	..	..
197,294			5	5	Uxbridge, Maidenhead, &			
88,330	"	Aug. 26	6⅝	6½	Wycombe 5 p.c.	85—90	..	..
91,800	"	"	5	5	Do. 5 p.c. pref.	80—85	..	..
	"	"	6⅝	6½	Do. 5 p.c. Maidenh'd	85—90	..	83
90,000					Wandsworth, Wimbledon, and Epsom—			..
255,636	"	July 8	8½	8½	Wandsworth A 5 p.c.	122—127	..	
412,450	"	"	7	7	Do. B 3½ p.c.	102—107	..	..
352,000	"	"	5/19/0	5/19/0	Do. C and New	88—93	..	..
98,000	"	"	6⅝	6⅝	Wimbledon 5 p.c.	98—103	..	..
88,416	"	"	7⅛	7⅛	Epsom 5 p.c.	104—109	..	100—100½
	"	June 24	3	3	3 p.c. Deb.	54—57	..	..
								56½

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *Ex. div. † Paid free of income-tax. ‡ Plus 8½ p.ct. p.a. special dividend. § For year.

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J. F. AULD,
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DAVID VASS.
Gas Works,
Perth.

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H. LEONARD PORCHER,
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Municipal Buildings,
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Nov. 4, 1926.